

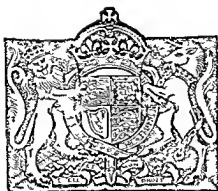
DUE DATE SLIP**GOVT. COLLEGE, LIBRARY**

KOTA (Raj)

Students can retain library books only for two weeks at the most

BORROWER'S No	DUE DATE	SIGNATURE

CHECKED 20 APR 1959



AGRICULTURAL MARKETING IN INDIA

Report on the MARKETING OF LINSEED IN INDIA

List of Agents in India from whom Government of India Publications are available.

(a) PROVINCIAL GOVERNMENT BOOK DEPOSITS.

MADRAS —Superintendent, Government Press, Mount Road, Madras
BOMBAY —Superintendent, Government Printing and Stationery, Queen's Road, Bombay.
SIND —Manager, Sind Government Book Depot and Record Office, Karachi (Sadar).
UNITED PROVINCES —Superintendent, Government Press, Allahabad
PUNJAB —Superintendent Government Printing, Punjab, Lahore
CENTRAL PROVINCES —Superintendent, Government Printing, Central Provinces, Nagpur
ASSAM —Superintendent, Assam Secretariat Press, Shillong
BIHAR —Superintendent, Government Printing, P. O. Gulzarbagh, Patna
NORTH WEST FRONTIER PROVINCE —Manager, Government Printing and Stationery, Peshawar.
ORISSA —Press Officer, Secretariat, Cuttack

(b) PRIVATE BOOKSELLERS.

Advani Bros., P. O. Box 100, Cawnpore
 Aero Stores, Karachi.*
 Banthya & Co., Ltd., Station Road, Ajmer
 Bengal Flying Club, Dum Dum Cantt.*
 Bhawanani & Sons, New Delhi
 Bombay Book Depot, Charni Road Gurgaon, Bombay
 Bhatia Book Depot, Sadar Bazar, Ranikhet.
 Book Company, Calcutta
 Booklovers' Resort, Taikad, Trivandrum, South India.
 Burma Book Club, Ltd., Rangoon.
 Butterworth & Co., (India), Calcutta.
 Chatterjee & Co., 3, Bacharam Chatterjee Lane, Calcutta.
 Chukerverty, Chatterjee & Co., Ltd., 15, College Square, Calcutta
 City Book Club, 98, Phayre Street, Rangoon.
 Das Gupta & Co., 54/53, College Street Calcutta
 Dastane Brothers, Home Service, 456, Raviwar Peth, Poona 2
 Delhi and U. P. Flying Club, Ltd., Delhi.*
 English Book Depot, Kerasopore
 English Book Depot, Taj Road, Agra
 English Bookstall, Karachi.
 English Book Store, Ahottabad, N. W. F. P.
 Fakir Chand Marwah, Peshawar Cantt.
 Fero Book Agency, Simla.
 Gautama Brothers & Co., Ltd., Weston Road, Cawnpore
 Hurnbothams, Madras
 Hindu Library, 137/F, Balaram De Street, Calcutta.
 H. L. College of Commerce Co-operative Stores Ltd., Ahmedabad
 Hyderabad Book Depot, Chaderghat, Hyderabad (Deccan)
 Imperial Book Depot and Press, near Jama Masjid (Machhlwalan), Delhi
 Indian Army Book Depot, Dayalbagh, Agra.
 Indian Book Shop Benares City
 Indian School Supply Depot, Central Avenue, South, P. O. Dharwad, Calcutta
 Insurance Publicity Co., Ltd., Lahore
 International Book Service, Rooms of
 Jacques & Co., Hampton Road, Nagpur, Messrs. Neston.
 Jaina & Bros., Mori Gate, Delhi, and Connaught Place, New Delhi, Messrs J. M.
 Kamala Book Depot, 15, College Square, Calcutta.
 Karnataka Publishing House, Bangalore City
 Keale & Co., 60 Britto Road, Karachi Sadar
 Keshao Book Stall, Khadi Bazar, Belgium.
 Kitabistan, 17 A, City Road, Allahabad
 Krishnaswami & Co., Teppakulam P. O., Trincomopoly Fort, Messrs S
 Lahiri & Co., Calcutta, Messrs S. K.
 Local Self Govt. Institute, Bombay
 London Book Co. (India), Arbab Road, Peshawar, Murree, Nowshera, Rawalpindi
 Mackwin & Co., Booksellers, Stationers and News Agents, Inverarity Road, off Esplanade Street, Karachi Sadar

Malik & Sons, Sialkot City
 Mathur, B. S., Bookseller, Civil Lines, Jodhpur
 Messrs. U. P. Malhotra & Co., Post Box No. 94 Lahore.
 Minerva Book Shop, Anarkali Street, Lahore
 Modern Book Depot, Bazar Road, Sialkot Cantonment
 Modern Book Depot, Napier Road, Jullundur Cantt. and Carera, Mohini Road, Lahore
 Mohanlal Dossabhai Shah, Rajkot
 Mohindra Bros., Lashkar Gwalior State, Messrs Nandikore & Bros., Chowk, Benaras City
 New Book Co., "Kitab Mahal", 192, Hornby Road, Bombay
 Newman & Co., Ltd., Calcutta, Messrs. W. Oxford Book and Stationery Company, Delhi, Lahore, Simla, Meerut and Calcutta
 Parikh & Co., Saroda, Messrs. B.
 Pioneer Book Supply Co., 20, Shib Narayan Das Lane, Calcutta, and 219, Cloth Market Delhi
 Popular Book Depot, Grant Road, Bombay
 Punjab Religious Book Society, Lahore
 Raghunath Prasad & Sons Patna City
 Rama Krishna & Sons Booksellers, Anarkali, Lahore.
 Ram Krishna Bros., Opposite Bhubnibag, Poona City
 Ram Narain Lal, Katra, Allahabad
 Ramesh Book Depot & Stationery Mart, Kashmir Gate, Delhi
 Ray & Sons, 43, K. & L. Edwardes Road, Rawalpindi, Murree and Peshawar, Messrs J
 Roy Chowdhary & Co., 72, Harrison Road, Calcutta, Messrs. N. M.
 Sharada Mandir, Ltd., Nai Sarak, Delhi
 Saraswati Book Depot, 15, Lady Barhoge Road, New Delhi.
 Sarcar & Sons, 15, College Square, Calcutta, Messrs. M. G. Sarkar & Co., Ltd. 6 Hastings Street, and 8/2, Hastings Street Calcutta Messrs P. C.
 Standard Bookstall, Karachi
 Standard Bookstall Quetta
 Standard Book Depot, Lahore, Dalhousie and Delhi
 Standard Law Book Society, 63, Harrison Road, Calcutta.
 Tara & Sons Razmak (India), Messrs. B. S.
 Taraporewala Sons & Co., Bombay, Messrs D. P.
 Thacker & Co., Ltd., Bombay
 Thacker, Spink & Co., Ltd., Calcutta and Simla
 Tripathi & Co., Booksellers, Prince's Street, Kalbadevi Road Bombay, Messrs N. M.
 University Book Agency, Kachari Road, Lahore
 Upper India Publishing House, Ltd., Literature Palace, Ammuddaula Park, Lucknow
 Varadachary & Co., Madras, Messrs. P.
 Venkatasubban, A. Law Bookseller, Vellore
 Wheeler & Co., Allahabad, Calcutta and Bombay. Messrs A. H.
 Young Man & Co., Egerton Road, Delhi.

TABLE OF CONTENTS

	i	GE
Introduction	.	xiii
Chapter I Supply	- -	1
A World production		1
B Indian production	-	3
(1) Acreage	-	3
(a) Total		3
(b) Distribution of area		5
(c) Trend of sowings	- -	6
(d) Mixed crop		
(2) Product on	- -	8
(a) Standard yields	- -	8
(b) Estimation of production	- -	9
(c) Yield per acre	- -	9
(d) Total outturn	- -	10
(e) Trend		14
(3) Quality		14
(a) Types and qualities		14
(b) Commercial description		15
(c) Distribution by qualities	-	16
(d) Oil content		17
(e) Impurity content		18
(4) Retention in villages		19
(a) For seed and for domestic use		20
(b) For village <i>ghanis</i> or <i>kolhus</i>		21
(5) Season of marketing		21
(a) Time of harvesting		21
(b) Periodicity		21
C Imports		23
D Exports		24
(1) Quantities		24
(2) Destinations		26
(3) Qualities		27
(4) Periodicity		28
E Imports of linseed oil	- -	30
(1) Quantities and sources	- -	30
(2) Qualities	- -	31
(3) Periodicity	- -	32

	PAGE
F Exports of linseed oil and cake	32
(1) Linseed oil	32
(a) Quantities and destinations	32
(b) Quality	33
(c) Periodicity	33
(2) Linseed cake	34
(a) Quantities and destinations	34
(b) Quality	35
(c) Periodicity	35
G Total and net available supplies of linseed and linseed products	37
(1) Linseed	37
(2) Linseed oil and cake	38
H. Note on the trade in linseed and its products in Burma	39
Inter-Chapter One	40
Chapter II—Utilisation and demand	44
A. Utilisation	44
(1) For export	44
(2) For internal consumption	44
(a) Seed	44
(b) Domestic consumption	44
(c) Oil extraction	45
(3) Summary of utilisation	45
B Demand	45
(1) Quality requirements	45
(a) For export	46
(b) For internal consumption	47
(2) Quantitative requirements	47
(a) Power driven mills	47
(i) Areas exporting cake through Calcutta—United Provinces, Bihar Orissa and Bengal	48
(ii) Areas exporting cake from Bombay (including Vizapatnam)—Central Provinces, Central India, Rajputana, Bombay and Hyderabad	50
(iii) Areas which do not export cake abroad—Punjab and Kashmir	51
(iv) Total requirements of the power driven mills	51
(b) Village <i>ghanis</i>	52
(c) Summary of total utilisation of linseed for oil extraction in India	54

	PAGE.
(3) Factors affecting the demand	54
(a) For export	54
(b) For internal consumption	55
(4) Periodicity	57
(5) Trend	57
(6) Inter-provincial trade	58
Inter-Chapter Two	60
Chapter III.—Wholesale prices	63
A Indian prices—Official and trade	63
B. Comparison of Indian and world prices	66
C Relation between the prices of Indian and Plate linseed in the United Kingdom—effect on exports from India to the United Kingdom	70
D. Price differences in respect of quality	74
(1) Quality	74
(2) Impurity content or refraction	76
E Price variations in the same market	77
F. Comparison of prices in different markets	79
G Seasonal variations	82
(1) United Provinces	82
(2) Bihar and Orissa	82
(3) Central Provinces	83
(4) Bombay and Hyderabad	83
(5) Punjab	83
(6) At the ports—Bombay and Calcutta	84
(7) Summary	84
H. Comparison of "futures" prices	85
I. Market intelligence	88
(1) Daily newspapers	88
(2) Trade press	89
(3) Government publications	89
(4) Post, telegraph and telephones	90
(5) Radio	91
(6) General	91
Inter-Chapter Three	93

	PAGE
Chapter IV —Preparation for Market	98
A Harvesting threshing and winnowing	98
(1) Harvesting	98
(2) Threshing	98
(3) Winnowing	99
(4) Costs	100
B Practice in other countries	100
Inter-Chapter Four	101
Chapter V —Assembling	102
A Methods of assembling	102
(1) Cultivators	102
(2) Landlords village merchants and money lenders	102
(3) It nerant merchants	103
(4) Wholesale merchants and crushers buying agents	103
(5) Producers co operative societies	104
B Markets	104
(1) Primary (village) markets	104
(2) Secondary markets	105
(3) Terminal markets	106
(4) Ownership and control	107
(5) Regulated markets	108
(6) Areas served by markets	108
C Persons engaged in assembling	109
(1) <i>Arhatiyas</i>	109
(2) <i>Dalals</i> or brokers	109
(3) <i>Tolas</i> and <i>bayas</i>	110
(4) <i>Palledars</i> or <i>hammals</i>	110
(5) Others	110
D Market practices	110
(1) General	110
(2) Procedure of sale	110
(3) Methods of sale	112
(a) The Cover system	112
(b) The Open system	112
(c) The Auction system	112

			PAGE.
E	Market charges	—	113
	(1) Taxes and tolls	.	113
	(2) Commission and brokerage		114
	(3) Handling and weighment charges	.	114
	(4) Charges for other services		114
	(5) Charities		115
	(6) Quality and weighment allowance		115
	(7) Miscellaneous		115
	(8) Total market charges		117
F	Finance of assembling		118
	(1) Village <i>baniya mahajan</i> and <i>sahukar</i>		118
	(2) <i>Arhatiyas</i>		118
	(3) Banks		118
	(4) Co operative societies		119
	Inter Chapter Five		121
	Chapter VI—Grading and Standardisation	— —	124
A	Classification	— —	124
	(1) Export markets	— —	124
	(2) Internal markets	— —	124
	(3) Defects in the present system		124
B	Quality factors		125
	(1) General		125
	(2) Moisture content		125
	(3) Impurities		126
	(a) Non oleaginous impurities		126
	(b) Oleaginous impurities		127
	(4) Condition—damaged grains		128
	(5) Variations in refraction		128
C	Practice regarding sales		130
	1) Sales on refraction guarantee basis		130
	(2) Sales on sample		130
	(3) Sales after inspection of the goods		130
	(4) Sales on fair average quality		131
	5) Sales on contracts		131
	(a) <i>Mills</i> contracts		131
	(b) Exporters purchasing contracts		132
	(c) Futures contracts		132
	(d) Exporters selling contracts		133

	PAGE
D Methods of sampling and analysis	133
E Standardisation	136
Inter-Chapter Six	138
Chapter VII —Conservation	143
A Methods of storage in different provinces and States in India	143
(1) In villages	143
(a) By cultivators	143
(b) By landlords and village merchants	144
(2) In markets	144
(3) At mills	145
(4) At ports	145
B Cost of storage	146
(1) In villages	146
(2) In markets	147
(3) At mills	147
(4) At ports	147
(5) Costs abroad	148
C Effect of storage on quality	148
D Comparison between bulk and bag storage	152
E Storage costs in relation to seasonal fluctuations in prices	153
F Stocks and storage accommodation	154
(1) Stocks and carryovers	154
(2) Periodicity	156
(3) Total storage accommodation	157
Inter-Chapter Seven	158
Chapter VIII —Handling and Transportation	161
A Handling	161
(1) On the farm	161
(2) At the market	161
(3) At railhead	163
(4) At river ghats	163
(5) At ports	164
(6) Containers and possibilities of handling in bulk	164

	PAGE
B Transportation	165
(1) By road	165
(a) Pack animals	165
(b) Bullock carts and camel carts	165
(c) Motor lorry	166
(d) Cost of conveyance	167
(2) By rail	168
(a) Railway freight	169
(i) Class rates	169
(ii) Schedule rates	170
(iii) Station to station rates	170
(b) Terms of booking	170
(3) By river	172
(4) By sea	173
(a) Coastal trade	173
(b) Foreign trade	173
Inter-Chapter Eight	175
Chapter IX—Wholesale distribution	177
A Agencies and methods	177
(1) Cultivators	177
(2) Village merchants	177
(3) Commission agents (<i>arhatiyas</i> , <i>kacheha</i> and <i>palka</i> and wholesale merchants)	178
(4) Co-operative organizations	178
(5) Exporters	179
(6) Oil mills	180
B Finance of wholesale distribution	180
(1) <i>Arhatiyas</i> and wholesale merchants	181
(2) Exporters and mills	181
(3) Banks	181
(4) <i>Shroffs</i>	182
(5) Remittances	184
C Cost of distribution	185
D Total assembling and distribution costs—The price spread from consumer to producer	191

	PAGE
E Trade associations and trading in futures	195
(1) Number and location	195
(2) Objects constitution membership and source of revenue	195
(3) Business methods of different associations	197
Inter-Chapter Nine	203
Chapter X —The manufacturing and distribution of linseed products	206
A Linseed crushing	206
(1) Types of crushing establishments	206
(a) Village <i>ghanis</i>	206
(b) Power driven mills and rotary <i>ghanis</i>	206
(i) Hydraulic presses	206
(ii) Expellers	207
(iii) Rotary <i>ghanis</i>	207
(c) Comparison of different types of plant	207
(2) Number and location of crushing establishments and quantities of linseed estimated to be crushed	209
(a) Village <i>ghanis</i>	209
(b) Power driven mill and rotary <i>ghanis</i>	209
(3) Yield of linseed oil and cake	212
(4) Cost of crushing	212
(5) Linseed products	213
B Linseed oil	213
(1) Production	213
(2) Quality	13
(a) Raw linseed oil	213
(b) Bodied linseed oil	214
(c) Red seed oils	214
(3) Brands	215
(4) Comparison between the quality of bodied oils manufactured in India and imported oils	215
(5) Containers	216
(a) 40/45 gallon heavy steel drums (with bands)	216
(b) 40/45 gallon light steel drums (without bands)	216
(c) 5 gallon drums	217
(d) 4 gallon tins	217
(e) 1 gallon drums	217
(f) Suitability of different types of containers	217

	PAGE
(6) Demand	218
(a) For industrial uses	218
(b) For edible use	219
(7) Prices	220
(a) Relation of the prices of linseed oil with those of linseed and linseed cake	220
(b) Seasonal variations	223
(c) Price variations in different markets	223
(d) Price variations for different qualities	223
(e) Margin between wholesale and retail prices	224
(8) Distribution	227
(a) Wholesale trade	227
(i) Sales to wholesale merchants	227
(ii) Sales to large consumers direct	228
(iii) Sales through commission agents	228
(iv) Sales through their own selling organisations	228
(b) Retail trade	229
(9) Adulteration	230
C Linseed cake	232
(1) Quantities produced and qualities	232
(2) Demand	232
(3) Prices	233
(4) Distribution	234
(5) Presence of castor seed and husk in linseed cake	235
(6) Manufacturers' associations	237
D Railway freight on linseed oil and cake as compared with that on linseed	238
Inter-Chapter Ten	240
Chapter XI—Seed	248
A Supplies	248
(1) Quantities	248
(2) Sources	248
(3) Distribution	249
B Control of supply of pure linseed	250
C Seed Growers' Associations	250
D Quality considerations	250
E Research work	251
F Further possibilities	253
Inter-Chapter Eleven	254

	Page
Chapter XII—Weights and measures and units of sale	256
A Weights and measures in current use	256
(1) Weights	256
(2) Measures	257
(a) For Linseed	257
(b) For oils	258
(3) Checking of weights and measures	258
B Scales employed	258
C Units of sale	258
(1) For price quotations	259
(2) For transacting delivery	259
Inter-Chapter Twelve	261
Final Inter-Chapter—Summary of Conclusions and Recommendations	264
Appendices—	
I—World acreage production and exports of Linseed	274
II—Acreage under Linseed in the main producing areas in India	275
III—Acreage under Linseed in certain provinces and States in India	276
IV—Yield per acre of Linseed in the main producing areas in India	278
V—Production of Linseed in the main producing areas	280
VI—Production of Linseed in certain provinces and States of India	282
VII—Number of grains per gramme and oil content in commercial samples of Linseed collected from different parts of India	283
VIII—Approximate production of different qualities of Linseed in India classified according to the present commercial standards	284
IX—Average monthly despatches and arrivals of Linseed at certain important centres of production and consumption	285
X—Exports of Linseed from India (British Indian Ports)	286
XI—Acreage production exports and quantities of Linseed retained in India	288
XII—Imports and exports of Linseed (by rail and river) into and from different provinces and States of India during 1919-20 and 1934-35 to 1936-37	290

	PAGE
XIII—Trade (rail and river borne) in Linseed between different provinces and States of India (Average 1934 35 to 1936 37)	291
XIV—Average monthly wholesale prices per maund of Bold and Small Linseed at Bombay	292
XV—Average monthly wholesale prices per maund of Bold and Small Linseed at Calcutta	293
XVI—Average monthly c & f prices of Calcutta Linseed in London	294
XVII—Average monthly c & f prices of Plate Linseed in London	295
XVIII—Average monthly premiums for Calcutta over Plate Linseed in London	296
XIX—Number of occasions on which the weekly closing futures price was at a premium (+) or discount (—) as compared with ready prices at Calcutta	297
XX—Number of occasions on which the weekly closing futures price was at a premium (+) or discount (—) as compared with ready prices at Bombay	298
XXI—Specimen Agreement to secure a Cash Credit on Goods deposited	299
XXII—Approximate share of different agencies in the assembling of Linseed in the main producing areas of India	301
XXIII—Market charge on Linseed in certain assembling markets in the United Provinces	302
XXIV—Market charge on Linseed in certain assembling markets in Bihar and Orissa	303
XXV—Market charges on Linseed in certain assembling markets in the Central Provinces and Berar	304
XXVI—Market charge on Linseed in certain assembling markets in the Bombay Presidency	305
XXVII—Market charges on Linseed in certain assembling markets in Bengal Punjab and Central India and Rajputana States	306
XXVIII—Market charges on Linseed in certain assembling markets in Hyderabad	307
XXIX—Average of market charges on Linseed in assembling markets in different provinces and States in India	308
XXX—Moisture content in commercial samples of Linseed collected from different parts of India	310
XXXI—Impurities and damaged linseed in commercial samples of Linseed collected from different parts of India	311
XXXII—Comparison of Linseed contracts of certain associations and mills in respect of the bases of refraction standards for Bold linseed and methods of sampling	312
XXXIII—Linseed Contract used by an Oil Mill at Calcutta	314

	PAGE
XXXIV—Contract Form of the Grain Merchants Association, Bombay	315
XXXV—Contract Form of the Marwadi Chamber of Commerce, Limited Bombay	316
XXXVI—Contract Form of the Calcutta Wheat and Seeds Association	317
XXXVII—Typical Exporters Contract	319
XXXVIII—Extracts from the Incorporated Oil Seed Association (London) contract for East Indian linseed to United Kingdom ports	322
XXXIX—Approximate returns on stocks of Linseed held at Calcutta and Bombay	324
XL—Approximate returns on stocks of Linseed held at up country markets	325
XLI—Estimated stocks of Linseed	326
XLII—Results of analysis of certain samples of boiled Linseed Oils imported and manufactured in India	327
XLIII—A few representative instances showing the price spreads from producer to consumer in the marketing of Linseed	328
XLIV—Specifications for Linseed Oil	330
XLV—Monthly wholesale prices of Linseed Linseed Oil and Linseed Cake at Bombay	333
XLVI—Average monthly wholesale prices of Linseed Linseed Oil and Linseed Cake at Calcutta	334
XLVII—Average monthly wholesale prices of Linseed Linseed Oil and Linseed Cake at Nagpur	335
XLVIII—Prices of various brands of Linseed Oil at Madras per 5 gallon drum	336
XLIX—Average monthly retail and wholesale prices of Paw Linseed Oil at Delhi	339
L—Average monthly whole sale and retail prices of Raw Linseed Oil at Amritsar	340
LI—Extract from the London Cattle Food Trade Association Contract for Imported Feeding Cakes and Meals	341
LII—Extract from the Hamburg Cattle Food Trade Association General Arrival Contract No III A (Indian Oil cakes)	343
LIII—Typical Contract used by Exporters in India for the purchase of Oilcakes	345
Glossary of vernacular terms	347
Diagrams	32
Maps	4
Plates	28

INTRODUCTION

This report bears out the fact that there is ample scope for improving the returns to linseed growers by reducing the cost of distribution from the field to the final buyer

At present the grower generally gets about ten annas of the rupee paid by the exporters and the millers located at large industrial centres in India, and only a little more than eight and a half annas out of the rupee paid by importers of linseed in the United Kingdom

There is plenty of evidence of wasteful practices, for example in paying freight on dirt and unnecessary cleaning and recleaning of the linseed. Further, market charges are altogether too numerous and excessive. Octroi and terminal taxes hamper the trade in all directions and adulteration both of linseed and linseed oil is rampant

This report sets out the plain facts of the situation and shows how better prices can be obtained for producers by way of economies in distribution, by reducing the harvest time depression, by securing a premium on quality and by widening the market for their produce

The general reader is advised in the first instance to read through the inter chapters at pages 40, 60, 93, 101, 121, 138, 158, 175, 203, 240, 254, 261 and 264. It is hoped however that these may prove sufficiently interesting to lead to a more detailed study of the full report

Thanks and acknowledgments are due to a large number of traders, manufacturers and others for their

kind assistance in making this report possible by freely giving their time and friendly co operation to the marketing staffs throughout the country

NOTE—The Government of India should not be regarded as assuming responsibility for all or any of the material contained in this report

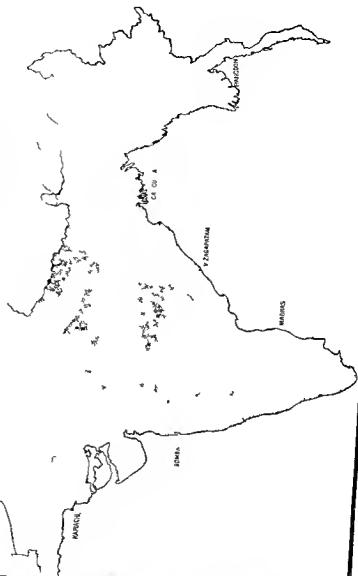
OFFICE OF THE AGRICULTURAL MARKETING ADVISER
TO THE GOVERNMENT OF INDIA,
DELHI
May, 1938

DISTRIBUTION OF LINSEED ACREAGE

IN INDIA

(DOT REPRESENTS 500 ACRES)

(AVERAGE 1972-74)



CHAPTER I—SUPPLY

A—World Production

The linseed plant (*linum usitatissimum*) is cultivated on a large scale mainly in four countries namely, Argentina U S S R (the Union of Soviet Socialist Republics), India and the United States, in their order of importance. As far as world trade is concerned, however, the crop of the U S S R is of practically no importance as its production concerning which the available information is meagre, is almost entirely absorbed by the internal market.

While the Argentine crop has consistently been the most important factor in international trade during the present century, it has acquired an even greater significance since the War and now entirely dominates the world linseed position. In the five years immediately preceding the War, exports of La Plata* linseed represented about 45 per cent of the world's shipments, but between 1931 and 1935 Argentine's share of the international trade in this oilseed had risen to 88 per cent. In 1936 and 1937 the share was 80 and 82 per cent respectively (Appendix T).

Based on the average of the world acreage† for the period 1931 to 1935 and in 1936 about 47 per cent of the total world area was located in the Argentine, but owing to the relatively high yields obtained in that country, the production of Argentine linseed amounted during the same time to about 64 per cent of the world's supplies. By far the greater part of the Argentine crop is exported. Between 1931 and 1935 on an average approximately 94 per cent of the local production was shipped abroad mostly to Europe, while in 1936 the exports were about 80 per cent of the production.

During the same period India accounted for about 28 per cent of the total world area. In respect of production however India's share was relatively lower. Between 1931 and 1935 the outturn of the Indian crop on an average amounted roughly to 17 per cent of the world's production and in 1936 to 16 per cent. Exports from India are variable. Between 1931 and 1935 on an average 39 per cent of the crop was exported but in 1936, the proportion was as much as 64 per cent. Speaking broadly, India now exports about half of her linseed crop.

NOTE.—The references to percentages of Indian acreage and production in this section as well as all subsequent references to these statistics are based on revised data discussed in this Chapter, and will be found in many cases to differ appreciably from the figures which form the conventional official forecasts and are subsequently incorporated in the annual publication "Estimates of Area and Yield of Principal Crops in India." Taking an average for the 12 years 1925-26/1936-37 the actual area under linseed in India was at least 400 000 acres greater than the area given in the final forecasts—a difference of over 13 per cent. Similarly the revised outturn over the same period averages about 72 000 tons or 19 per cent larger than the production shown in Estimates of Area and Yield of Principal Crops in India.

*Argentine linseed is also commonly described in the trade as La Plata or Plate linseed. These terms will be frequently found in the report.

†The area and production figures of U S S R have been excluded in the consideration of world trade for the reasons stated above.

B—Indian Production

The linseed plant is cultivated in India not for the fibre (flax), but for its seed which yields an oil used mainly for industrial purposes, e.g., in the manufacture of varnishes and paints, etc., and, in certain parts of India, for human consumption in edible preparations.

Linseed is predominantly a rain fed crop and is rarely cultivated under artificial irrigation. A moderate amount of rainfall seems best suited for its cultivation. In all the main linseed areas the average annual rainfall ranges between 30 and 70 inches per annum.

The plant does well under a variety of soil conditions. It grows as well in the heavy deep moisture retaining soils of Central and Peninsular India as in the lighter Gangetic alluvium of the United Provinces and Bihar. There are, however, considerable differences between the types of linseed grown under these two soil conditions. In the former areas the plants are deep rooted grow rapidly and produce relatively fewer but bolder grains. On the other hand a characteristic of the linseed grown in the moist alluvial soils of the Gangetic plain is a shallow root system which coupled with a slower rate of development is responsible for smaller seed but more abundant yields.

(1) ACREAGE

(a) *Total*—The area under linseed for each of the past 12 years, as published in the Estimates of Area and Yield of Principal Crops in India is shown in detail in Appendix II and may be conveniently summarised as follows—

Acreege under Linseed in the main producing areas

(Thousand acres)

	Average 1925 26 to 1929 30	Average 1930 31 to 1934 35	1935 36	1936 37	1937 38 *
<i>British India—</i>					
Bengal	127	123	98	131	137
Bihar (and Orissa)	649	638	549	509	595
Bombay	116	130	113	101	107
Central Provinces and Berar	900	923	1 131	1,131	1 243
Punjab	29	29	28	31	30
United Provinces	938	877	810	898	948
<i>Indian States—</i>					
Central Provinces States	05	09	130	130	130
Hyderabad	245	319	418	468	471
Kotah (Rajputana)	74	87	94	94	107
Others	8	33	03	51	71
Total	3 231	3,208	3,457	3,594(a)	3 839

*Provisional (final forecast)

(a) Revised figure 3,677

These data are based on the annual forecasts which refer to the main producing tracts only and do not cover all the areas in which linseed is grown. For example, no account is taken of Assam, Madras, the North West Frontier Province, the minor administration of Ajmer Merwara, certain Indian States* and Burma whose areas are only subsequently shown in the publication of Agricultural Statistics of India, issued annually about a year after the Estimates of Area and Yield and some two years or more after the latest crop year dealt with. The area under linseed in these tracts will be found detailed in Appendix III and is summarised below —

Acreage under Linseed in certain provinces and States not included in crop forecasts

(Thousand acres)

	Average 1925 26 to 1929 30	Average 1930 31 to 1934 35	1935 36	1936-37
<i>British India—</i>				
Assam, Madras and others	18	11	6	9
<i>Indian States—</i>				
Central India States Gwalior and Rajputana States, etc	208	208	218	207
Total	226	219	224	216

Enquiries made during the course of this survey also showed that there is considerable acreage under linseed in certain other Central India and Rajputana States for which no statistics are published even in the Agricultural Statistics of India nor are any records available in the States. Although annual data over an extended period could not be obtained, it has been possible to arrive at an approximation from the information specially supplied by the State Durbars concerned, and from personal enquiries made on the spot †. This hitherto unrecorded area amounts to about 211,000 acres of which 150,000 are in Rewah alone (Central India) and the remaining 60,000 acres are divided among 12 States, of which the most important are Dhar (Central India) and Partabgarh (Rajputana) which jointly account for 27,000 acres.

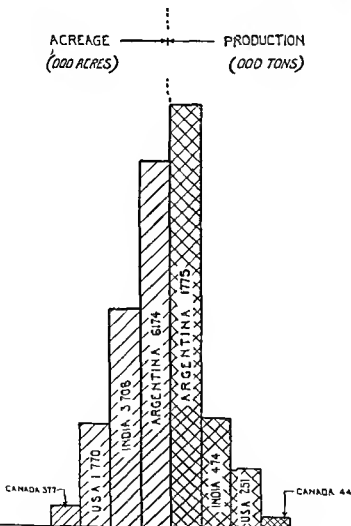
Further the adjustments as between the forecasted acreage published in Estimates of Area and Yield, and the final consolidated figures shown in Agricultural Statistics of India in respect of three States Hyderabad Bhopal and Kotah (Rajputana), usually necessitate some addition ‡ to the forecasted figures—quite large in some years as for instance approximately 325,000 acres in 1929-30.

*Vide column B in the table on page 5

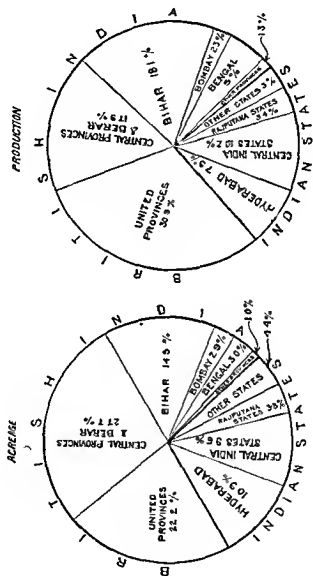
†Vide column C in the table on page 5

‡Vide column D in the table on page 5

ACREAGE & PRODUCTION OF LINSEED IN THE CHIEF PRODUCING COUNTRIES OF THE WORLD AVERAGE 5 YEARS 1931/35



SHARE OF DIFFERENT PROVINCES & STATES IN ACREAGE & PRODUCTION
OF LINSEED IN INDIA
AVERAGE 1934-35 TO 1936-37.



It is obvious therefore that the forecasted area as well as that recorded in Agricultural Statistics of India are both considerable understatements of the true position, and that the total acreage in fact amounts on an average to about 450 000 acres above the forecasted area. The position over the past 12 years would then appear as shown in the following table —

Total acreage (revised) under Linseed in India
(Thousand acres)

	Area reported in Estimates of Area and Yield (Appendix II)	Area in States and Provinces published on 1.1 Agricultural Statistics (Appendix III)	Area in States not reported at all (Approx.) (Page 4)	Adjustments for Hyderabad, Kotah and Bhopal (Page 4)	Revised Grand Total
	A	B	C	D	E
1925-26	3 596	272	211	+132	4 211
1926-27	3 931	213	211	+65	3 820
1927-28	3 311	220	211	+73	3 824
1928-29	3 109	245	211	+89	3 654
1929-30	2 802	172	211	+325	3 510
Average 1925-26 to 1929-30	3 230	226	211	+137	3 804
1930-31	3 009	221	211	+65	3 506
1931-32	3 309	246	211	+58	3 824
1932-33	3 999	220	211	-19	3 711
1933-34	3 261	186	211	-2	3 656
1934-35	3 410	220	211	+10	3 851
Average 1930-31 to 1934-35	3 258	219	211	22	3,710
1935-36	3 457	294	211	*	3 892
1936-37	3 594(a)	216	211	*	4 021

(b) *Distribution of area*—The map which faces page 1 illustrates the distribution of linseed acreage in India and the relative share of the different provinces and States is shown in the diagram opposite this page

*Not yet available
(a) Revised figure 3,677

In the Central Provinces about 60 per cent of the provincial area under linseed is to be found in the eastern division, of which the three districts of Drug, Raipur and Bilaspur contain over 45 per cent. The southern division ranks second with about 23 per cent with the two districts of Nagpur and Chanda accounting for 11 per cent while the other two divisions in the north and west contain the remaining 17 per cent of the provincial acreage.

In the United Provinces the linseed area lies mainly in the north east and south west. The Gorakhpur and Fyzabad divisions in the north east contain over 48 per cent of the total provincial area while the Shamsi division in the south west has about 26 per cent. About 16 per cent of the linseed area occurs in the central divisions of Allahabad and Benares. The cultivation of linseed in the north western districts lying in the Meerut Agra Rohilkund and Bhamoia divisions is almost negligible. More than 40 per cent of the provincial crop is found in three districts alone viz. Gonda Gorakhpur (north-east) and Jalaun (south west).

In Bihar the Muzaffarpur division contains about 41 per cent and Gaya division nearly 37 per cent of the total provincial area. The districts of Champaran and Saran in the former division and Shahabad in the latter hold the largest linseed acreages.

In Hyderabad more than 85 per cent of the linseed area is located in the northern and western districts adjoining Berar and the Bombay Presidency namely Aurangabad Parbhani Nanded Bidar Osmanabad Bidar and Gulbarga.

In the Bombay Presidency the districts bordering on Hyderabad also have the most important areas under linseed. About 82 per cent of the provincial linseed area is centred in the districts of Bijapur Sholapur Ahmednagar and Nasik.

In Bengal more than half of the linseed acreage of the province occurs in the three central districts of Nadia Murshidabad and Pabna.

(c) *Trend of Sowings*—This is clearly shown in the diagram facing page 8 which is based on the revised data to which reference has already been made. It will be seen that there was a progressive decline from 4.2 million acres in 1925-26 to 3.5 million acres in 1929-30 and 1930-31. The area expanded again to 3.8 million acres in 1931-32 and was followed by a slight contraction in the two succeeding seasons. Since 1934-35 however the total average area has been well over 3.8 million acres and the latest available data for 1936-37 is above the 4 million mark. Heavy exports in 1933-34 due partly to the preference granted under the Ottawa Agreement checked the declining tendency of the acreage sown in 1932-33 and 1933-34 to some extent with the result that sowings increased by about 5 per cent in 1934. The upward trend was maintained in two succeeding crops and may be attributable also to the rising price level.

(d) *Mixed crop*—Agricultural practice in regard to the sowing of linseed is not the same all over the country. In the United Provinces and Bihar the system of sowing linseed with other crops prevails on a large scale the favourite mixtures being with wheat gram

rapeseed and mustard. Indeed the practice is so common that the area under linseed as a mixed crop considerably exceeds the area sown pure. Mixed sowings are less popular in the Central Provinces and other adjacent tracts. In other parts of the country, linseed is generally sown alone.

There appear to be three important reasons for mixed sowing. In the first place it is a form of insurance against total crop failure. Secondly, when grown with wheat or other food crops, linseed is supposed to protect the latter from the depredations of cattle, wild pig, deer, etc., as these animals do not relish the linseed plant. Lastly, linseed tends to exhaust the soil so that interculture with leguminous crops such as gram helps to maintain the fertility of the land.

The mixed crop area in the United Provinces is estimated according to an old formula suggested in 1889 (since when it has not been modified) by the then Director of Agriculture in that province. Half of the total acreage under gram is taken as sown with linseed (ordinarily in rows) and one sixth of the total acreage of wheat, barley, and their mixtures is taken as sown with linseed (mostly as a border). The normal yield per acre of linseed sown as mixed crop with gram and with wheat, barley or wheat-barley mixtures is taken as 1.5 maunds (124 lb) and 0.5 maund (41 lb) respectively. It is obvious that as the linseed mixed crop is reckoned as a fixed proportion of gram and wheat acreage, fluctuations in the area under these cereals reflect on the linseed acreage also. The increase or decrease in wheat and gram areas may or may not be attended by a corresponding change in the linseed acreage, more so when the acreage under these cereals has been changing considerably during the last 50 years. The estimation of the present linseed area by this formula is therefore not likely to be correct.

That this would actually appear to be the case is indicated by an examination of the outward rail traffic from the Gorakhpur district, which very largely depends on the export market. In 1920-30 exports from Gorakhpur amounted to 753,000 maunds out of a local pure sown crop of some 45,000 acres, together with an area under mixed sowing which unfortunately cannot be ascertained as the district figures for mixed sowings are not recorded. The mixed crop area for the province was 550,000 acres. In the following year when there was an increase of 20 per cent in the local pure sown area and probably only a small decrease in the mixed sown area of the district (as might be anticipated from a decline of about 9 per cent in the total provincial mixed area), exports from Gorakhpur fell by nearly 24 per cent. In 1931-32 despatches from Gorakhpur dropped to 321,000 maunds or by about 44 per cent, although the local pure sown area expanded by 15 per cent and the total provincial mixed area by over 28 per cent. In 1932-33 despatches were 10 per cent below the previous year's while there was nearly 30 per cent contraction in the local pure sown area and a fall of 9 per cent in the total provincial mixed area. In 1933-34 however outward traffic increased by nearly 50 per cent to 436,000 maunds, while the local pure sown area declined by nearly 50 per cent and the provincial mixed area rose by about 6 per cent only.

Speaking broadly and having regard to the unreliability of the data available, it cannot be said that the practice of sowing linseed as a mixture in the United Provinces is on the decrease. Between 1925-26 and 1929-30 the average area sown mixed was 610,000 acres while the pure crop was only 327,000 acres. In the quinquennium ending 1934-35 the mixed crop acreage was 615,000 and the pure 262,000. In 1935-36 the mixed crop had risen to 650,000 acres while the pure sown crop dropped to 195,000 acres. In 1936-37, however, the pure crop area rose to 298,000 acres and the mixed crop declined to 609,000 acres (Appendix II).

In Bihar, linseed is largely grown mixed with wheat or gram or as a border in fields sown with other *rabi* crops. It is also occasionally sown in paddy fields amongst the standing paddy crop. The proportion of the crop sown in these different ways can not be ascertained with any accuracy, and although all these methods exist almost all over the province to a small or large extent the sowing of linseed as a mixed crop is generally speaking, more common in North Bihar while pure sowings prevail in South Bihar.

In the Central Provinces only about 6 per cent of the crop is sown mixed. In the Bombay Presidency linseed is occasionally found to be sown with wheat and gram and with mustard. In the Central India States it is sometimes cultivated with gram and in Madras with *Cholam* (*Sorghum Vulgare*).

(2) PRODUCTION

(a) *Standard yields*—A provisional estimate of the yield per acre of the principal crops was first made in India in 1892 and in order to provide for the periodical revision of the estimates a system of experimental crop cuttings was prescribed. From the results of these experiments reported by local governments and administrations at the close of each quinquennium standard yields are worked out. These standard yields are understood to represent the average output on average soil in a year of average character and form the basis for estimating production during the quinquennium following.

The latest available figures for standard yield are for the quinquennium ending 1931-32. These and the standard yields of the four previous quinquennia are shown in the table below—

Standard yield of Linseed (lb per acre)

Province	Quinquennium ending				
	1911-12	1916-17	1921-22	1926-27	1931-32
Assam	448	448	336	336	336
Bengal	490	443	467	473	607
Bihar (and Orissa)	490	492	490	490	490
Bombay	360	360	360	360	360
Central Provinces	296	296	296	296	215
United Provinces	500	500	500	500	500

ACREAGE, YIELD PER ACRE & PRODUCTION OF LINSEED

LBS PER ACRE

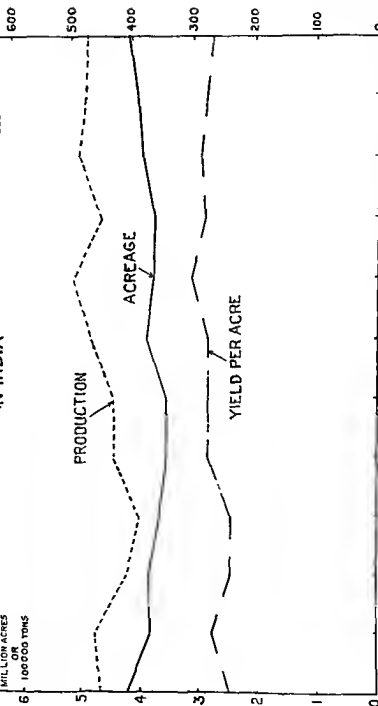
IN INDIA

MILLION ACRES
OR
100 000 TONS

PRODUCTION

ACREAGE

YIELD PER ACRE

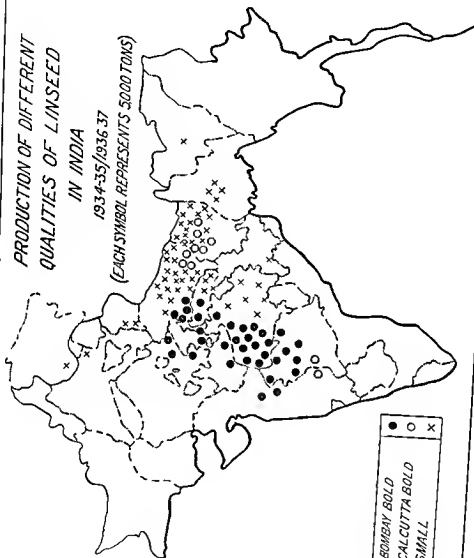


1925/26 1926/27 1927/28 1928/29 1929/30 1930/31 1931/32 1932/33 1933/34 1934/35 1935/36 1936/37

*PRODUCTION OF DIFFERENT
QUALITIES OF LINSEED
IN INDIA*

1934-35/1936-37

(EACH SYMBOL REPRESENTS 5000 TONS)



●	○	×
BOMBAY BOLD	CALCUTTA BOLD	SMALL

The striking fact that standard yields have apparently needed no revision for 20 years in certain instances calls for a word of explanation

In Bihar while new methods of random sampling are being experimented on the local authorities consider it premature to use the new results and the old data continue to be maintained for the present. Similarly the necessity of improving the existing system has been fully recognised in Bombay but the introduction of any new methods had to be postponed owing to financial stringency. It is understood that no crop cutting experiments were made in the Presidency during the quinquennium ending 1931-32. In Bengal the yield for the quinquennium ending 1931-32 was deduced solely from experiments conducted during the period in question without taking into consideration previous results and the raising of the standard yield was attributed to the spread of improved varieties and adoption of revised methods of calculation. In the Central Provinces the standard yields were only slightly modified in 1926-27 and 1931-32. Owing to the abnormal weather conditions which prevailed in some of the intervening years it was considered that the results obtained could not be taken as a satisfactory basis for revision and they were accordingly modified to a nominal extent only. Although crop cutting experiments have been steadily continued in the United Provinces no change in the standard yield has apparently been found necessary.

(b) *Estimation of production*—Production is calculated on the formula $\text{area} \times \text{standard yield} \times \text{seasonal factor}$ to which detailed reference has already been made in the Report on the Marketing of Wheat in India (Marketing Series No. 1). It will be sufficient to notice here that the first factor area is known accurately only for the pure sown crop in temporary settled provinces such as the United Provinces, Bombay etc. In the permanently settled tracts which form the great bulk of the area of Bengal and an appreciable portion of Bihar such information is extremely unreliable. The area under mixed crops whether in temporary or permanently settled areas is highly conjectural while the data relating to the Indian States is by no means complete. Owing to the large proportion of the mixed crop in the United Provinces and Bihar the inaccuracy of primary data and its effect on All India statistics of area and production cannot be over emphasised. The second factor namely the standard yield is frequently based on old and out of date information while the appraisal of the third or seasonal factor is largely left in the hands of petty village officials*.

(c) *Yield per acre*—The actual yield per acre obtained by dividing the total estimated production of linseed by the acreage is considerably lower than the standard yield as in the case of wheat. The yields over the past 12 years as published in Estimates of Area and Yield of Principal Crops will be found in detail in Appendix IV. The all India average summarised therefrom is given below and

*The present system of crop reporting in general has been adversely criticised in A scheme for the Economic Census of India.—Bowley and Robertson (1934).

is compared with the revised all India average based on the revised figures of acreage and production, *vide* pages 5 and 13. The latter show some improvement in yield per acre.

Average yield of Linseed

(lb per acre)

	Average 1925 26 to 1929 30	Average 1930 31 to 1934 35	1935 36	1936 37
All India Average based on Estimates of Area and Yield	259	275	251	261
All India Average based on revised figures of acreage and production	260	286	275	265

The yield per acre for the whole of India during the 12 year period 1925 26 to 1936 37 has fluctuated between 246 lb in 1928 29 and 304 lb in 1932 33, with an average of 260 lb in the quinquennium ending 1929 30 and 286 lb during the 5 years ending 1934 35.

Compared with the yield in foreign countries, Indian outturns per acre in the quinquennium ending 1934 35 were 34 lb lower than those of the United States, and less than half of the average yields per acre in the Argentine. The average yields in these two countries for the five crops ending 1935 were 320* lb and 636* lb respectively.

(d) *Total outturn*—The production of linseed by provinces and States for the 12 years, 1925 26 to 1936 37 as published in Estimates of Area and Yield in counterpart of the acreage shown in Appendix II and summarised on page 3, is recorded in detail in Appendix V. The position of each important unit of production is as follows—

Production of Linseed in the main producing areas

(Thousand tons)

	Average 1925 26 to 1929 30	Average 1930 31 to 1934 35	1935 36	1936 37	1937 38 §
<i>British India—</i>					
Bengal	18	23	16	25	27
Bihar (and Orissa)	100	94	{ 75† 1†	{ 81† 1†	87† 1†
Bombay	12	13	12	8	9
Central Provinces and Berar	68	80	80	85	103
Punjab	3	3	2	3	3
United Provinces	147	143	147	148	157

*Grain, Seed and Oil Reporter, London

†Bihar

‡Orissa

§Provisional (Final forecast)

Production of Linseed in the main producing areas—contd

(Thousand tons)

—	Average 1925 26 to 1929 30	Average 1930 31 to 1934 35	1935 36	1936 37	1937 38
<i>Indian States—</i>					
Central Provinces States	7	8	5	4	8
Hyderabad	13	23	33	44	41
Kotah (Rajputana)	3	9	11	10	13
Others	1	3	6	6	8
Total	372	399	388	416(a)	457

As is the case with the acreage reported in Estimates of Area and Yield, the statistics of production above quoted do not embrace all the tracts in which linseed is grown. Notable omissions are the Central India States of which Rewah, Barham and Indore are probably the most important. Gwahior certain Rajputana States such as Jampur, Bundi, Tonk etc and Kashmir. A rough estimate for these areas calculated on the approximate yields per acre and the average area over 10 years is given in Appendix VI and amounts to an average outturn of some 57,150 tons*.

A further addition† to the published estimates has also to be made in respect of the production of Hyderabad State. It was found from the State Customs records and confirmed by the publication Accounts relating to the Inland Rail and River borne Trade of India that the quantities exported from the Nizam's Territories exceed the local production given in Estimates of Area and Yield sometimes by a large margin. As there are practically no imports of linseed into the State (the estimated annual incomings by road are only about 20 tons while receipts by rail are equally insignificant) it seems clear that the outturn is, in correctly recorded. The extent of this almost continual understate-
ment of production cannot be gauged with precision but the total

*Fide column B in the table on page 13

†Fide column C in the table on page 13

(a) Revised figure 420

crop of linseed in Hyderabad cannot obviously be smaller than exports plus local retention. The last factor annually amounts to approximately 4,000 tons (consisting of about 2,500 tons required for seed and domestic consumption and some 1,500 tons consumed by the local oil mills) and accordingly, the revised production in Hyderabad State would appear to be as shown in the table below —

Production of Linseed (revised) in Hyderabad State.
(Thousand tons)

	Production as reported in Estimates of Area and Yield	Imports	Exports as recorded by the State Customs	Revised produc- tion calculated on exports plus an average local retention of about 4,000 tons
1925-26	16	Neghigable	19	23
1926 27	13	"	19	23
1927 28	11	"	24	28
1928 29	11	"	29	33
1929 30	16	"	17	21
1930-31	16	"	18	22
1931 32	23	"	22	26
1932 33	18	"	55	59
1933 34	26	"	47	51
1934 3	34	"	45	49
1935 36	33	"	62	66
1936-37	44*	"	30*	44

*From 1936 37, production is being reported on a revised basis Exports in that year are less than the production

Taking all the foregoing factors into account the total revised production in India may be summarised below, the share of different provinces and States being illustrated in the diagram facing page 5

Total (revised) production of Lanseed in India
(Thousand tons)

	Production reported in the Estimates of Area and Yield (Appendix V)	Production in areas for which forecasts are not made (Page 11)	Difference between the published and revised outturns in Hyderabad (Page 11)	Revised Grand Total
	A	B	C	D
1925-26	402	57	+7	466
1926-27	406	57	+10	473
1927-28	348	57	+17	422
1928-29	322	57	+23	401
1929-30	380	57	+5	442
Average 1925-26 to 1929-30	372	57	+12	441
1930-31	377	57	+6	440
1931-32	416	57	+3	476
1932-33	406	57	+41	504
1933-34	376	57	+25	458
1934-35	420	57	+15	492
Average 1930-31 to 1934-35	399	57	+18	474
1935-36	388	57	+33	478
1936-37	418(a)	57		475

It will be seen from this statement that the revised outturn for the quinquennium ending 1929-30, is 69 000 tons or 16 per cent greater, and for the quinquennium ending 1934-35, 75,000 tons or 17 per cent greater than the data given in Estimates of Area and Yield. This wide discrepancy would seem to indicate the necessity

(a) Revised figure 420

for making the forecast more comprehensive than it is at present, if the data are to be of any real value to the trade

(e) *Trend*—The revised figures of production given in the above statement show that the total outturn of the crop during the last 12 years has varied between a minimum of 401 000 tons in 1928-29 and a maximum of 504 000 tons in 1932-33. During this period the trend of production has not always followed the trend of acreage (diagram facing page 8) and there is no evidence of any consistent trend up or down. It is however impossible to comment further on the variation in production in view of the uncertainty of the seasonal condition factor estimates and the doubtful accuracy of the production estimates to which reference has already been made.

(3) QUALITY

a) *Types and qualities*—The nature of the soil plays an important part in determining the quality characteristics of the linseed grown in different parts of India. In the Gangetic alluvium of the United Provinces, Bihar and Bengal the sub-soil moisture is never far from the surface. The linseed plant of those parts has therefore a shallow and extensive root system. The plant matures relatively slowly, throws out a large number of branches and yields abundant seed which is generally small in size. In Central India the Central Provinces, Bombay and the Deccan soil conditions are suitable only for a plant with a deep root system. The Peninsular types of linseed grow rapidly to maturity, have fewer branches and form comparatively fewer seeds, and are bolder in size and richer in oil content than the seed grown in the northern tracts.

An examination of the linseed crop made at the Agricultural Research Institute, Pusa in 1922 showed that there were at the time 26 distinct types of linseed in India, each distinguished by difference in colour, in the size of the seed and in other botanical characteristics. The size of the seed is the main consideration in the commercial classification of linseed. Colour has a limited significance only since the great bulk of the crop is of the brown variety and the production of white and yellow linseed is very small. Moreover the latter quality is rarely marketed pure and is generally found mixed with the usual brown types.

Linseed grown in the United Provinces, Bihar, Bengal, Assam, Punjab and Kashmir is invariably of the brown variety. The crop of Central and Peninsular India is predominately of this type.

The yellow and white varieties are cultivated on a relatively small scale in the Central Provinces, Central India and some of the Rajputana States.

Most of the white or yellow linseed crop is located in the Central Provinces, where it is known as *howri*. It is found in almost every district mixed with the brown variety in proportions ranging from

1 to about 15 per cent. No authentic records of the area under white or yellow linseed are available but judging from actual arrivals in the markets it may be estimated that 4 per cent of the total provincial area under linseed is sown with these varieties. The total outturn of this quality is also difficult to assess owing to the absence of data but enquiries from cultivators would seem to place the yield at 25 per cent less than that of the brown linseed*. On this basis about 3 per cent of the average production of the province may be taken to represent the crop of white and yellow linseed. This is equivalent to about 2 700 tons†. In Central India and Rajputana States the production is about 900 tons or not more than 2 per cent of the local crop. The total estimated production of white and yellow linseed in India is therefore less than 1 per cent of the total crop.

The white and yellow varieties are richer in oil content than the brown and it would appear that at one time the light coloured seeds were greatly esteemed by certain European millers producing very pale oils. Improvements in manufacturing and refining processes and increased supplies of the oil bearing seeds have resulted in the virtual disappearance of any special demand that may have existed formerly. At present the export trade pays no premium for white or yellow linseed.

(b) *Commercial description*—Broadly speaking the trade recognises two types of linseed—Bold Brown and Small Brown. With in this general classification there are three commercial qualities termed Bombay Bold, Calcutta Bold and Small each differing from the other in size of the grain only. (See plate facing page 16.) The small linseed handled at Bombay and Calcutta is very similar and as the bulk of the trade in small linseed is concentrated at Calcutta, the latter is often termed Calcutta Small especially in the export trade.

Bombay is the natural outlet for the large grained linseed grown so extensively in Central and Peninsular India which generally averages under 135 grains per gramme. This type of linseed naturally predominates in the Bombay market and the distinction between Bombay Bold and Small is made according to local usage by an analysis based on the separation of small linseed from bold by a special kind of sieve. (See plate facing page 17.) Linseed passing through this sieve is classed as Small. A free tolerance (by weight) of 10 per cent of small linseed is permitted in tenders or deliveries of Bombay Bold. Allowances are charged for any proportion of small linseed above 10 per cent up to a maximum tolerance of 35 per cent at which point the goods are liable to rejection at buyer's option.

*It is also on record that one white variety experimented on at the Agricultural College Farm Nagpur in 1933-34 gave the lowest yield of any variety of linseed then under trial.

†Enquiries have also shown that producers who grew white linseed a few years ago have given it up owing to the low yields. It is reported that the outturn in the best soils was barely equal to that of brown linseed in ordinary soils.

The bold linseed consigned to Calcutta derives mainly from the southern districts of Bihar and from the Central United Provinces. It is appreciably smaller than its Bombay counterpart. Contrary to the Bombay system the standard for Calcutta Bold is fixed by count. The standard adopted by the Incorporated Oil Seed Association London is 145 grains per gramme as probably the most widely recognised basis in India although certain buyers' contracts specify tolerances ranging between 140 and 152 grains. The limit of tolerance laid down in the Incorporated Oil Seed Association contract for Calcutta Bold is 153 grains to the gramme with an allowance to buyer for every grain in excess of the basic 140. Linseed having more than 153 grains per gramme automatically falls into the Small category.

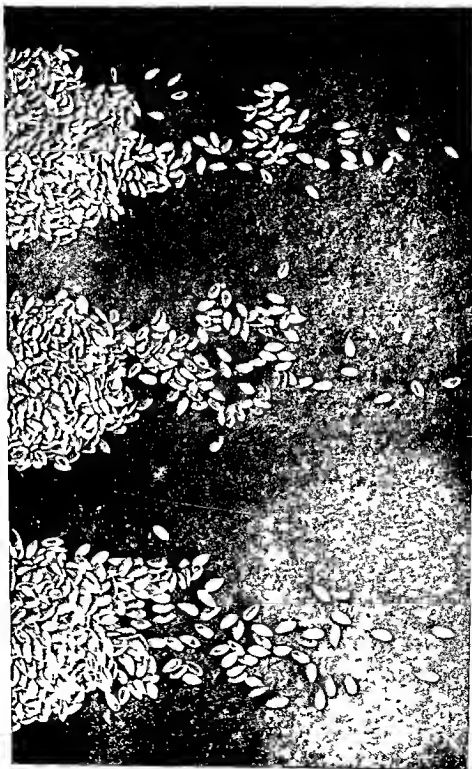
The description Calcutta Small includes all the small grained varieties which form the great bulk of the production in the United Provinces, Bihar, Bengal and Assam. Broadly speaking any linseed which fails to conform to the accepted standards for Bold is termed Small and in practice any linseed having over 150 grains per gramme is classed as Calcutta Small.

(c) *Distribution of qualities*—In order to ascertain the quality characteristics and the distribution of the different qualities of linseed 724 commercial samples were collected at all stages of the marketing chain throughout India. These samples were examined at the Harcourt Butler Technological Institute, Cawnpore for their physical characteristics and a representative selection thereof amounting to 205 samples were further subjected to chemical analysis for oil and moisture content. The result of this work is partially summarised in Appendix VII which shows the number of grains per gramme and the oil content in the produce of different parts of India.

In the United Provinces the small linseed area lies in the northern districts of Gonda, Basti, Bahraich and Gorakhpur whence samples of the local production averaged 183 grains per gramme. In the extreme south of the province, bordering on the Central Provinces and some of the Central India States, there is a large area producing linseed conforming to the Bombay Bold quality, viz. in the districts of Thansi, Jalaun, Hamirpur and Banda where the average was 110 grains to the gramme. Linseed grown in the central districts of the United Provinces such as Benares, Ghazipur, Allahabad, Mirzapur, etc. was placed somewhere between these two extremes with an average of 154 grains per gramme. A fair proportion of the linseed grown in the Benares and Mirzapur area passes as Calcutta Bold.

In Behar the northern districts grow small linseed resembling the qualities produced in the adjacent parts of the United Provinces and the average of the local crop was found to be about 190 grains to the gramme. Linseed tenderable as Calcutta Bold is however found in moderate quantities in some of the southern districts round Patna and Gaya. The average of this area was 150 grains per

Linseed grains (according to the existing commercial classification)



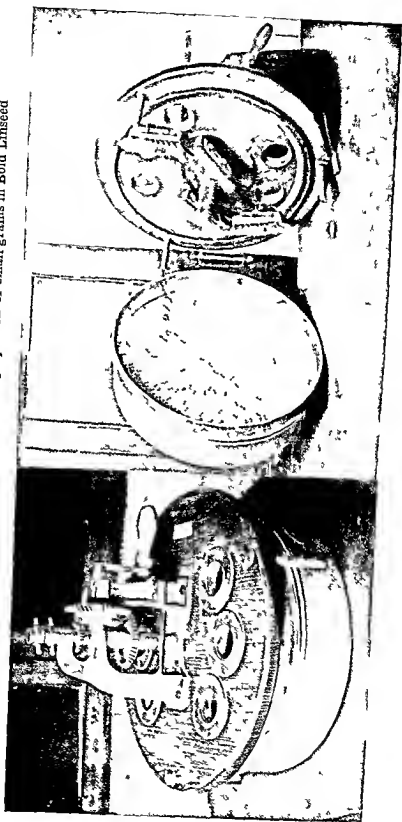
Small

Calcutta Bold

Bombay Bold

The grains in the illustration represent the actual size

Apparatus used at Bombay for determining the proportion of small grains in Bold Linseed



gramme and thus bears comparison to the bold variety grown in the Central United Provinces

In the Central Provinces the eastern districts of Raipur and Drug grow small linseed averaging 164 grains per gramme a part of which now finds an outlet through Vizagapatam on the Bay of Bengal. There is a progressive and marked increase in the size of the seed towards the west of the province. In the districts of Berar, Saugor and Hoshangabad the local production averages 1½ grains to the gramme while in the central parts of the province *eg* the Nagpur and Jabalpur districts the average was 130 grains.

The production of Hyderabad and the Bombay Presidency consists almost entirely of large grained linseed. The Hyderabad samples averaged 129 grains per gramme while in Bombay the average was 134 grains to the gramme.

With the exception of Rewah and the neighbouring States where small linseed predominates the Central India and Rajputana States grow bold linseed of a type tenderable against the Bombay Bold contract.

Bengal produces a particularly small grained variety of linseed averaging 201 grains to the gramme.

The linseed crop of the Punjab and Kashmir is of local importance only. Linseed grown in these areas and in Assam is exceptionally small in size indeed smaller than the linseed grown in Bengal.

The approximate distribution of the various qualities of linseed according to the commercial classifications already referred to will be readily apparent from the map facing page 9 and from Appendix VIII.

Roughly speaking the production of bold linseed corresponding to the Bombay Bold definition amounts to about 39 per cent of the total Indian crop that of small linseed to about 51 per cent and the intermediate quality corresponding to the Calcutta Bold standard to nearly 9 per cent. The production of white and yellow linseed forms less than 1 per cent of the total Indian crop. The quantities of different types may be roughly summarised thus:

	Tons
White & yellow linseed	3 900
Bombay Bold (brown)	186 400
Calcutta Bold (brown)	40 800
Small linseed (brown)	244 900
Total	476 000

(d) *Oil content*—Within certain limits the oil content of linseed is closely related to its size the larger the grain the greater being the yield of oil. The highest oil yielders are the types of

linseed grown in the Central Provinces Bombay, Hyderabad, the Central India and Rajputana States and in the south of the United Provinces the great majority of which are classifiable as Bombay Bold (Appendix VII)

Using petroleum ether for extraction and on a cleaned seed basis the average percentage of oil content in linseed from the various districts of the Central Provinces ranged from 40.93 for samples averaging 127 grains per gramme from the Wardha district to 44.64 for Hoshangabad linseed averaging 111 grains per gramme. The oil content of Bombay linseed ranged from 40.65 per cent in a sample from the Belgaum district with a count of 159 per gramme to 44.46 per cent for Sholapur linseed averaging 132 grains per gramme. Hyderabad samples yielded from 42.09 to 43.12 per cent of oil the former result being obtained from a quality averaging 132 grains per gramme and the latter from another averaging 120 grains. The highest oil bearing linseed found during the course of this survey derived from the Central India States of Bhopal Gwalior Dewas and Khilchipur. The average of three samples drawn at Dewas with a count of 112 grains gave 45.55 per cent oil. Samples from Gwalior and Bhopal averaging 112 and 121 respectively to the gramme showed 45.48 per cent oil while a sample from Khilchipur with 121 grains yielded 45.34 per cent oil. The range of oil content in Rajputana linseed was found to be from 42.69 to 44.44 per cent for linseed counting 104 and 109 grains per gramme from Dholpur and Kotah States respectively.

As regards small linseed the United Provinces samples showed an average of 41.54 per cent oil with a range between 41.24 per cent and 42.21 per cent the former relating to samples drawn at Gonda weighing 178 per gramme and the latter to Benares where the samples averaged 150 grains to the gramme. A large number of samples drawn in North Bihar averaged only 40.57 per cent oil. In this case the range was from 39.07 per cent for the very small grained produce of the Santhal Parganas averaging 229 to the gramme to 41.13 for the Saran District where the samples averaged 176 grains per gramme. Bengal linseed has an even lower oil content than Bihar and resembles the Assam quality. The average for 32 samples drawn in Bengal was only 39.45 per cent oil with a range between 38.28 and 41.22 per cent. Assam linseed as shown by the analysis of *Nawgong* quality yielded only 39.21 per cent oil.

The average oil content in grains of different sizes shown in the diagram opposite page 20 indicates clearly that below 100 grains to the gramme the more or less progressive increase in oil content which is apparent up to this point or near it disappears. The exceptionally large size of bold grained linseed is sometimes due to the coarsening and thickening of the skin and is accompanied by a corresponding reduction in the oil bearing pulp within. For this reason an average sample with a count of below 100 grains per gramme gives less oil than seed having say 120 or 125 grains.

(c) *Impurity content*—The impurity content of linseed consists of non oleaginous matter such as chaff dust stones lumps of

earth, cereal grains, etc., as well as other oilseeds. The extent to which these impurities are present varies with soil conditions and agricultural practices, e.g., the practice of sowing linseed as a mixed crop, and the care or indifference exercised at the time of threshing, winnowing and cleaning. The proportion of different impurities contained in the production of the various provinces and States is illustrated in diagram facing page 21 and is discussed in detail in Chapter VI.

It has been found, generally speaking, that there are fewer impurities in hold linseed than in small. The results of the analysis already mentioned indicate that the average impurity content (foreign matter and other oilseeds) in the production of Bombay and Hyderabad was only 3.63 and 3.59 per cent respectively. The impurity content found in the hold linseed samples from the western districts of the Central Provinces from Central India and the Rajputana States was comparatively high and averaged 5.59, 6.41 and 6.63 per cent respectively. The production of the north-eastern districts of the United Provinces and of Bihar where the bulk of the linseed grown is small, showed an average impurity content of as much as 8.52 and 10.11 per cent respectively. The Bold linseed produced in these two provinces was also found to be marketed in a dirty condition although the impurity content was somewhat lower than in the case of small linseed. The central districts of the United Provinces where mixed crop sowing is largely in vogue, have a still higher impurity average of 11.47 per cent. On the other hand small linseed from the Central Provinces shows the comparatively low average admixture of 5.34 per cent. Linseed from Bengal and Assam was found to have an average impurity content of 5.51 and 2.93 per cent respectively.

(4) RETENTION IN VILLAGES

Linseed is retained in the village for two main purposes (a) seed requirements, and (b) for the extraction of oil in the village *ghanis* or *kolhus** (See plate facing page 195). Linseed may also be retained for edible purposes, feeding cattle and for medicinal uses, but the quantities so consumed are comparatively small.

The proportion of the crop retained for the above uses varies greatly in different parts of India depending upon the local seed rate and the extent to which linseed oil is used for edible purposes (the hull of the linseed oil expressed by *ghanis* is not normally used for industrial purposes). Mustard oil is the most commonly consumed edible oil in the United Provinces, Bihar, Orissa, and

*The *Ghani* (or *Kolhu*) is a primitive arrangement on the pestle and mortar system for the extraction of oil from seed. It is found in almost every part of India particularly in the rural areas. In the village *ghani* the mortar more often than not is made from the hollowed out trunk of a tree while the pestle is also of wood sometimes shod with metal. The mode of operation is for the pestle to be rotated against the inner wall of the mortar the motive power being imparted by draught animals such as bullocks. See page 206, Chapter X.

Bengal, while linseed oil is more popular in many parts of the Central Provinces, Central India and the neighbouring tracts. Consequently the tendency is for more linseed to be retained against village requirements in the latter areas than in the former.

(a) *For seed and for domestic use*—It was almost invariably found that cultivators retained sufficient linseed on their own holdings for purposes of seed. When obliged to do so they also borrowed their seed from other cultivators or obtained it from the village *baniya* or merchant on the customary terms (Chapter XI). For all practical purposes, therefore, it may be taken that the linseed required for seed is almost wholly found out of the village retention. As regards domestic use, however, this factor is so variable as to be highly conjectural. In some localities in which linseed is an important crop, it is frequently used in the preparation of certain types of confectionery, while the feeding of linseed to cattle is more common in some areas than in others.

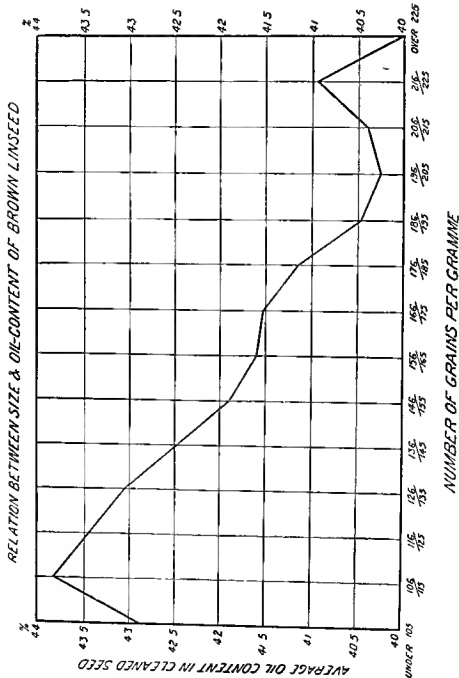
On the basis of an average seed rate in the United Provinces of about 20 lb per acre and taking a rough figure of 7,000 tons utilised in sweetmeats and cattle feeding—mainly in the four districts of Gorakhpur, Azamgarh, Ballia and Ghazipur—it is estimated that about 15,000 tons equivalent approximately to 10 per cent of the local production, are on an average retained in the villages of this province.

In Bihar (and Orissa) where the seed rate is approximately 12 lb per acre or roughly about two thirds that of the United Provinces, it may be reckoned that about 8,000 tons, or 10 per cent of the local production, are retained in the villages including the estimated household consumption. The seed rate in Bengal is much about the same as in the United Provinces and about 2,000 tons or some 10 per cent of the outturn appears to be the average retention there also.

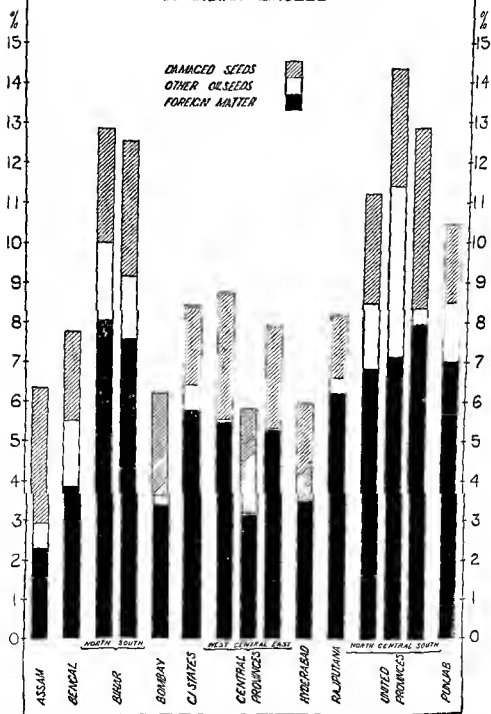
The quantities estimated to be retained on producers' holdings and in the villages of Central and Peninsular India for seed and domestic consumption are somewhere in the neighbourhood of 9,000 tons in the Central Provinces, 1,500 tons in Bombay and 2,500 tons in Hyderabad.

It will be seen, therefore, that the quantities of linseed retained for seed and domestic use in all the chief producing areas responsible for more than four fifths of the total Indian production, amount in the aggregate to something near 38,000 tons.

Enquiries have also shown that similar proportions are retained in other tracts including Rajpootana, the Central India States, Assam, Madras, Punjab and Kashmir. Accordingly therefore the total amount of linseed retained in the villages throughout the country for sowing and domestic requirements appears to be approximately 47,000 tons representing about 10 per cent of an average crop.



AVERAGE PROPORTION OF IMPURITIES IN INDIAN LINSEED



(b) *For village ghanis or kolhus*—The second channel of disappearance in the village is through the *ghanis* or *kolhus*. In addition to retention for seed and domestic use considerable quantities of linseed are retained for crushing in *ghanis*. The cake produced in the *ghanis* is almost wholly disposed of in the villages themselves but a portion of the oil surplus to local requirements is sent to other neighbouring markets usually by road. In the absence of any census of production it is quite impossible to say with any degree of precision how many *ghanis* are in operation in India nor is it possible to arrive at any definite figures as regards their capacity or the production of linseed or any other vegetable oil by them. These small plants handle a variety of oilseeds according to season. As opportunity offers their owners crush their own produce or oilseeds brought to them by others.

The utilisation of linseed by village *ghanis* is discussed in some detail in the next chapter so that for the present it will suffice merely to indicate the total quantity of linseed estimated to be retained for village crushing. On an average this amounts to about 65 000 tons of which about three fourths i.e., nearly 50 000 tons is found in the villages themselves while the remainder is drawn from the adjacent assembling markets.

The total retention in the villages and cultivators' holdings is therefore somewhere in the neighbourhood of 95 000 tons equal to about 20 per cent of the average crop.

(5) SEASON OF MARKETING

(a) *Time of harvesting*—As has already been noticed the main producing areas fall into two great natural divisions. In the north are the alluvial plains of the United Provinces Bihar and Bengal, and in the south the black cotton soils of the Central Provinces Central India States Bombay and Hyderabad. The time of harvesting varies slightly in these two areas. In the former the harvesting of the crop normally commences early in March reaches its height by about the end of that month and concludes towards the middle or end of April. The harvesting in Bengal and the adjacent parts of Bihar starting a fortnight to a month in advance of the United Provinces. In Central and Peninsular India however harvesting commences early in February.

(b) *Periodicity*—As with wheat the bulk of the linseed crop is brought to the market very shortly after it has been harvested and the flow of supplies to the markets is greatest in the three months immediately succeeding the harvest. Thereafter arrivals diminish and with the setting in of the monsoon the movement of the crop from village to market as is common with most agricultural products virtually ceases. After the rains which are normally over by the middle or end of September the surplus linseed held back in the villages gradually begins to reappear in the markets.

The volume of despatches of linseed in different months from a few important markets in four of the main producing areas have been shown over a period of years in Appendix IX along with the

volume of arrivals in some markets in Central Provinces* and at the terminal markets of Calcutta and Bombay. The variation in the seasonal movement is also illustrated in the diagram opposite page 24.

More than 41 per cent of the total despatches by rail from three stations† in the United Provinces were handled between April and June with May as the month of greatest activity. In Bihar the actual records as collected at ten important stations‡ revealed that more than 44 per cent of the outward traffic was registered during the same three months with May leading again. In Bengal where the crop matures a little earlier over 81 per cent of the despatches from two stations§ occurred between March and May. The slightly earlier maturity of the khus crop in the Central Provinces also accounts for the fact that more than 43 per cent of the total annual receipts into three important assembling centres|| were recorded in March, while the three months March to May accounted for more than 76 per cent of the annual total. Monthly despatches by rail from seven up country centres¶ in the Bombay presidency confirm that about 55 per cent of the annual traffic was booked between March and May, the busiest months being March and April which together accounted for nearly 40 per cent of the annual total.

Detailed records obtained from the port authorities at Calcutta and Bombay also reflect the periodicity of movements in the interior. In Calcutta for example, over 39 per cent of the average annual receipts were recorded between April and June while July, August and September accounted for 26 per cent. The months of lowest supplies were January and February, as their combined total was only a little more than 8 per cent of the annual figure. Compared with Calcutta the new crop arrives earlier at Bombay. Receipts rise sharply in March and continue to increase until the peak is reached in May. Of the total annual arrivals at the port more than 47 per cent were recorded during the 3 months, March to May. Arrivals in June and July represent about 16 per cent of the total annual receipts, those of August less than 6 per cent, while in September, receipts rose to nearly 11 per cent, due probably to the fact that this is the important delivery month of the year. Arrivals remained small for the rest of the season up to February.

*As a large proportion of the local crop is retained in the Central Provinces for internal consumption arrivals in the markets of that province represent the periodicity better than despatches, which are a fairer index of periodical movements in distributing areas, e.g., the United Provinces and Bihar, etc.

†Basti, Chargaon, Orai.

‡Buxar, Raghunathpur, Arrah, Barh, Luckesara, Warsahganj, Rafiganj, Palmerganj, Sasaram, Bhabua Road.

§Chudanga, Belmanga.

||Raipur, Rajnandgaon, Khamgaon.

¶Jeur, Sholapur, Akalkot Road, Lasalgaon, Niphad, Belapur, and Nigar.

In common with other spring (*rabi*) crops the movement of linseed from the village to the market is affected by the monsoon, although to a lesser extent as compared with wheat since not only is the linseed crop in point of size barely 5 per cent of the former, but it also matures earlier and is harvested and banded about a month in advance of wheat. The data quoted above indicates that by the end of May the pressure of arrivals has already dissipated itself owing to a large proportion of the crop having already been disposed of. Any slackening of movement during the rainy season from June to September cannot therefore be wholly attributed to the effect of the monsoon although it is a fact that heavy and continuous rainfall seriously impedes the movement of produce from village to market by rendering rural communications impassable. An example of this may be seen in the diminished arrivals by road at the two important markets of Raipur and Rajnandgaon in the Central Provinces. The total share of July, August and September in the total annual incomings is only 17 per cent. At Rajnandgaon the proportions are even smaller and amounts to less than 1 per cent for the same 3 months.

While heavy rain affects road traffic movements by river and canal tend to increase. With the swelling of the rivers country craft are able to extend their operations and since the cost of transport by boat is considerably lower than by rail or even by road appreciable quantities of linseed move by boats wherever navigation is possible. This is particularly true of the eastern United Provinces and of Bihar where the Ganges and some of its tributaries are navigable throughout the year and especially in the rainy season. (Chapter VIII). Rail and sea movements are relatively unaffected by the rains and some of the heaviest shipments of linseed are often made during the monsoon months. Loading and discharge operations at the docks may however frequently be interrupted for a day or two by exceptionally bad weather.

C—Imports

Imports of linseed by sea are negligible and have ranged from less than 1 ton to 124 tons the former occurring in 1935-36 and the latter in 1929-30. These small quantities were consigned from the Persian Gulf ports to Bombay. The quality of such imports corresponds to the indigenous small variety produced in the United Provinces and Bihar.

Imports by land frontier routes although small are considerably greater than imports by sea and amount on an average to about 3 per cent of the Indian crop. They derive mainly from adjacent areas in Nepal and Sikkim on the north east frontiers of India and find their way into the northern parts of the United Provinces and Bihar. Qualitatively the imported linseed is identical with the small linseed grown in British India. During the five years ending 1936-37 imports by land frontier routes averaged 13,760 tons.

of which 10 095 tons or about 73 per cent passed into Bihar and the remaining 3 665 tons into the United Provinces as will be seen from the following table

Imports of Linseed by land frontiers

(Tons)

	1932 33 *	1933 34	1934 35	1935 36	1936 37	Average	1937 38
United Provinces	4 480	4 060	2 654	3 972	3 208	3 665	3 238
Bihar	11 421	11 759	7 022	10 358	9 619	10 095	6 0
Total	16 901	15 812	9 681	14 330	12 827	13 760	10 813

With the exception of 1934 35 there have been comparatively small variations in the volume of this trade in recent years. No reliable data are available concerning the production or utilisation of linseed in Nepal and the adjacent tracts so that it is difficult to account for the heavy fall of 1934 35. Since the internal demand in India increased during 1934 35 (Chapter II) the decline may be ascribed either to a sympathetic expansion in local consumption or to a crop failure in those parts.

The periodicity of the frontier trade moves in harmony with the movement of the crop in India. About 37 per cent of the imports into India during the quinquennium 1931 32—1935 36 were recorded in April and May alone while from June to September the average imports represented some 33 per cent of the total annual incomings. As with the Indian crop January and February are the months in which the trade is at its lowest.

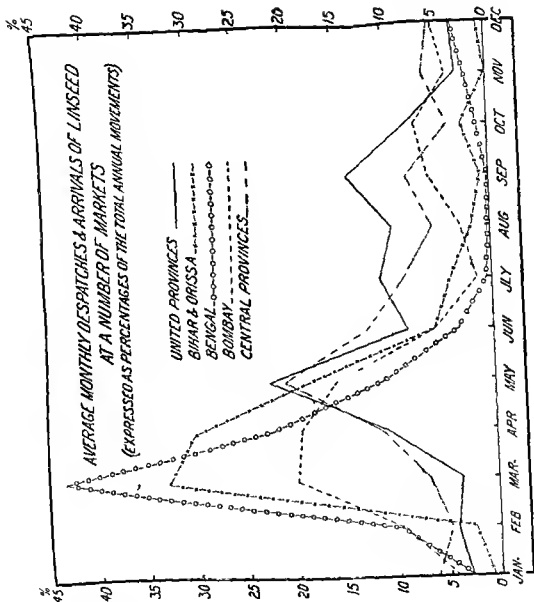
D.—Exports

(1) QUANTITIES

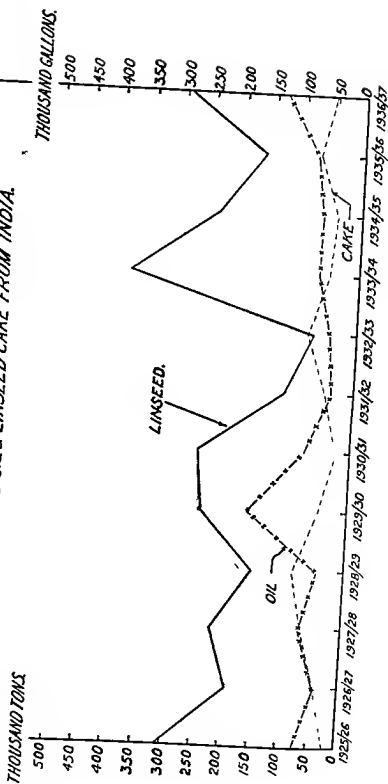
Exports of linseed from India which are subject to considerable variation (see diagram facing page 95) are very largely influenced by the size of the Argentine crop. The extent of the relationship is strikingly illustrated in the diagram facing page 56. With the post war expansion of the Argentine production Indian exports have suffered in comparison with her pre war share of the international trade. The following table shows that

* Import and export statistics and all movement data refer to the fiscal year 1st April to 31st March

**AVERAGE MONTHLY DESPATCHES & ARRIVALS OF LINSEED
AT A NUMBER OF MARKETS
(EXPRESSED AS PERCENTAGES OF THE TOTAL ANNUAL MOVEMENTS)**



EXPORTS OF LINSEED, LINSEED OIL & LINSEED CAKE FROM INDIA.



average shipments during the last ten years have fallen by more than one third as compared with the pre war decennium

Exports of Linseed from India
(Thousand tons)

<i>Pre War</i>		<i>Post War</i>	
1904 05	559	1928 29	157
1905 06	299	1929 30	248
1906 07	219	1930 31	257
1907 08	310	1931 32	190*
1908 09	160	1932 33	72*
1909 10	234	1933 34	383*
1910 11	371	1934 35	240*
1911 12	599	1935 36	165*
1912 13	592	1936 37	296*
1913 14	414	1937 38	226
Average	360	Average	216

Variations in the exports of linseed are also linked up to a certain extent with the internal demand which as will be seen in Chapter II depends on such factors as the production of other oil seeds and the relative prices of linseed and other vegetable oils principally groundnut and rape or mustard oil. When the difference between the value of linseed oil and that of other edible oils widens the former comes into greater demand for adulteration with the cheaper oils and thus brings about a corresponding increase in the demand for linseed.

No review of the export trade would be complete without a reference to the *Ottawa Trade Agreement* which conferred a preference of 10 per cent on all Indian linseed imported into United Kingdom. As a result of two successive bumper crops in the Argentine exports from India had fallen to the lowest level touched

*Including Mormugao

NOTE.—The published statistics of exports take no account of the shipments made from foreign possessions in India. The chief ports are Mormugao in Portuguese India on the Malabar coast and Pondicherry, the administrative headquarters of the French possessions in India on the Coromandel coast. There are no exports of linseed from Pondicherry but in recent years Mormugao has achieved some importance in this respect. From an average of 344 tons exported during the two years 1931 32—1932 33 shipments rose to 4363 tons in 1933 34 but have since fallen to negligible proportion. The detailed figures are given at the foot of Appendix X.

in the present century just when the Conference was sitting in the summer of 1932. The Indian Delegation to the conference therefore attached the greatest importance to the revival of the export trade, and considered that the United Kingdom was in a position to purchase larger quantities of Indian linseed, and that an increase in the demand from that country would probably result in an extension of cultivation in India. By 1933 the year in which the preference first became operative, two other factors developed and changed the outlook for Indian linseed. The Argentine produced a remarkably small crop while the outturn in the United States diminished by about 40 per cent to the exceptionally low level of 174 000 tons. These conditions were largely responsible for bringing about the greatly increased demand for Indian linseed in 1933-34. Nevertheless the effect of the preference cannot be ignored as far as the enormously increased absorption of Indian linseed by the United Kingdom market was concerned. By placing Argentine linseed at a disadvantage the parity at which the Indian product could be obtained having regard to its higher oil content greatly favoured the latter throughout 1933-34. Indeed at times in 1933 Calcutta linseed could actually be purchased more cheaply than Plate linseed. The net result was that the United Kingdom took nearly 176 000 tons* of Indian linseed in 1933-34 or more than twelve times as much as the average for the two preceding years. In 1934 and the succeeding years Indian linseed has continued to enjoy a good demand from the United Kingdom and the fact that such exports have more than counter balanced the partial loss of most of India's other markets seems to indicate that the preference has on the whole benefited the Indian export trade.

It is impossible to say whether and if so how far the preference has influenced Indian acreage materially although there has undoubtedly been a slight expansion as compared with the area seeded in 1933 (table on page 5). Unfortunately as pointed out on page 9 the Bengal and Bihar area figures are not dependable and the proportion of linseed in the mixed crop in the United Provinces, which has been increasing is determined by a conventional formula which tends to obscure the actual figures (see page 7). Be that as it may it seems clear that so long as the preference continues Indian linseed will have a definite advantage over Argentine linseed in the United Kingdom and will continue to maintain its present importance in that market.

(2) DESTINATIONS

On an average the United Kingdom has been India's largest individual customer since the War (Appendix X) but her present relation to India's export trade has become of even greater importance owing to the Ottawa preference which came into force in the beginning of 1933. In the seven years before the Agreement (1925-26 to 1931-32) Continental Europe (mainly France, Italy, Belgium and Germany) absorbed more than 55 per cent of India's exports while Great Britain's share was less than 26 per cent. The full effect of the Ottawa preference had not yet been felt in 1932-33

(when it was in force only in the last three months), for in that year more than 65 per cent of Indian shipments went to European countries (chiefly France and Italy) and only about 20 per cent to the United Kingdom. In 1933-34, however, there was a complete reversal in the relative shares of these consuming markets. In that year the United Kingdom drew about 46 per cent of India's exports while the share of Continental Europe dropped to about 28 per cent. By 1934-35 and 1935-36 exports to Continental countries declined still further to about 17 and 20 per cent while Great Britain's purchases were 44 and 55 per cent respectively. In 1936-37 the shipments to the United Kingdom rose to about 74 per cent* of the total exports while those to other European ports further declined to 12 per cent.

A significant feature in recent years has been the large shipments of hold linseed from Bombay to some of the Atlantic coast ports in the United States. The United States was an entirely negligible factor in the Indian export trade in the years prior to 1932-33 but lately a succession of short crops in that country, coupled with low production in Argentina caused purchases to be made in India to the extent of 85 000 tons in 1933-34 65 000 tons in the year following and 31 000 tons in 1935-36. Increased domestic production in 1936 and 1937 and large available supplies in Argentina have enabled the United States to find most of her requirements elsewhere so that her takings of Indian linseed in 1936-37 and 1937-38 have fallen being 17 000 and 7 000 tons respectively.

(3) QUALITIES

Most of the crushers in the United Kingdom and Continental Europe usually buy hold and small linseed indiscriminately depending principally on the relative price levels in the Bombay and Calcutta markets. For example if the Sterling c & f equivalent of the Bombay quotation is more favourable than that of Calcutta linseed having due regard to the quality differences (oil content) between the two types of linseed a greater volume of trade will be transacted in Bombay Bold. The converse would be the case if Calcutta Small happened to be comparatively cheaper. The availability of freight for the positions required is also another factor which to some extent determines whether the Calcutta or Bombay qualities are purchased.

Certain Continental mills importing their supplies through a few Mediterranean ports such as Piraeus, Genoa and Marseilles have a preference for the medium grained varieties approximating to the Calcutta Bold standard of 145 grams per gramme.

*In 1937-38 1 00 000 tons out of a total export of 996 000 tons i.e. more than 10 per cent were destined for the United Kingdom. This does not take into account 5 500 tons "for orders" shipments the destinations for which are not declared until many months after the shipments have been made. Information obtained from various sources however indicates that the bulk of these are destined for the United Kingdom. The practice of not declaring the destinations is common in Calcutta the object being to keep competitors in the dark.

The United States industry on the other hand is not generally interested in small linseed apart from an occasional few hundred tons shipped from Calcutta to Pacific coast ports, and has a decided preference for the Bombay Bold quality

(4) PERIODICITY.

The main shipping season is from April to December, and as will be seen from the statement below, shipments of linseed are on an average fairly well spaced out over this period although large variations occur in the individual months of different years

*Monthly exports of Linseed from British Indian Ports.**

(Thousand tons)

Months	1932-33	1933-34	1934-35	1935-36	1936-37	Average	1937-38
April	7	10	33	6	35	18	12
May	6	15	18	30	37	21	23
June	6	25	39	9	25	21	23
July	6	32	21	5	26	18	18
August	5	48	25	2	22	21	25
September	7	66	32	5	42	30	27
October	7	57	35	20	29	30	24
November	5	36	11	28	16	19	19
December	8	43	15	15	33	23	9
January	5	18	4	12	6	9	2
February	6	19	1	17	9	10	14
March	4	10	4	16	16	10	20
Total	72	379	238	165	290	230	226

The Indian crop begins to move to the market in March, but shipments of the new crop do not normally begin until April. The experience of the past few years has shown that exports tend to increase in May and June, decline slightly during July and commence to rise again in August reaching high levels in the last four months of the year when the Argentine season is drawing to a close

*All data relating to monthly exports (and imports) from British Indian ports are derived from Accounts relating to the Sea-borne Trade and Navigation of British India

After December, Indian shipments fall off and exports are at their lowest between January and March a period which synchronises with the end of season sickness in up country markets of India. Taking an average for the five years 1932-33 to 1936-37 about 26 per cent of the annual shipments take place in April, May and June, 25 per cent in September and October and the remaining 49 per cent during the remaining seven months of the year.

It is interesting to compare the periodicity of shipments from India with those from the Argentine. In that country the crop begins to move in December and exports are highest in the period January to March.

*Monthly exports of Linseed from Argentina**

(Thousand tons)

Months	1932	1933	1934	1935	1936	Average	1937
January	187	197	199	258	163	202	216
February	212	169	165	197	133	175	217
March	202	154	180	166	144	169	238
April	59	94	64	110	68	83	184
May	116	88	70	166	87	106	103
June	152	139	71	105	73	108	96
July	172	106	62	122	119	120	112
August	153	91	96	137	92	114	97
September	194	69	93	115	150	124	104
October	138	73	91	116	132	110	151
November	199	59	62	128	133	116	111
December	130	132	153	129	150	142	142
Total	1 919	1 371	1 353	1 749	1 454	1 569	1 773

Taking an average of the five years 1932-36 about 30 per cent of the annual shipments take place in the three months January to March about 19 per cent between April and June and about 23 per cent in each of the other two quarters of the year.

E—Imports of Linseed Oil *

(1) QUANTITIES AND SOURCES

The following table shows the position since 1925 26 —

Imports of Linseed Oil into India

Year	Through British Indian ports (Thousand gallons)			Through Kathiawar ports † (thousand gallons)	Grand Total for India (thousand gallons)	Equivalent in linseed ‡ (thousand tons)
	United Kingdom	Other Sources	Total			
1925 26	241	1	242		242	2 9
1926 27	230	2	232		232	2 8
1927 28	251	3	254		254	3 1
1928 29	231	5	236		236	2 9
1929 30	204	2	206		206	2 5
1930 31	156	2	158		158	1 9
1931 32	172	5	177	36	213	2 6
1932 33	172	3	175	52	227	2 8
1933 34	152		152	48	200	2 4
1934 35	158	1	159	74	233	2 8
1935 36	135	1	136	63	199	2 4
1936 37	143	1	144	47	191	2 3
1937 38§	114	1	115	31	146	1 8

It will be seen that the imported oil bears an almost insignificant proportion to the domestic output. During the last 3 years imports averaged 208 000 gallons only as compared with a local production estimated to average 16 250 000 gallons (67 000 tons). The amount of linseed represented by the average quantity of linseed oil imported is about 2 500 tons only whereas about 200,000 tons were on an average crushed annually in India during the triennium 1934 35 to 1936 37.

The chief source of imports is the United Kingdom whence 99 per cent of the oil received through British Indian ports is derived. The sources of origin of the oil imported through the Kathiawar

*There are no imports of linseed cake

†Trade Statistics relating to the Maritime States in Kathiawar and the State of Travancore

‡Approximately 81 gallons of oil per ton of linseed

§Since Burma has been separated from India from April 1937, figures for 1937 38 do not include imports of linseed oil into Burma, as in previous years

ports are not specifically mentioned in the Kathiawar trade statistics, but enquiries show that the bulk of such importations also derive from the United Kingdom. It will be observed that the imports of oil through British ports have displayed a distinct tendency to fall off but whether this is directly attributable to the diversion of the trade to Kathiawar ports cannot be said with certainty owing to the absence of data. It is however clear that imports through the Kathiawar ports have increased since 1931-32, when detailed information first became available.

The table below shows that Bombay handles the great bulk of the import trade in linseed oil with Sind a poor second.

Share of different provinces in imports of Linseed Oil

	Average 1925-26 to 1929-30	Average 1930-31 to 1934-35	1935-36	1936-37
<i>India—</i>				
Bombay	71.7	71.5	75.3	75.6
Sind	15.5	15.5	13.7	14.3
Madras	6.9	9.0	8.4	7.8
Bengal	1.1	0.9	1.3	1.2
Burma	4.8	3.1	1.3	0.9
Total	100.0	100.0	100.0	100.0

It will be observed that Bengal a large consuming area with Calcutta as its chief port imports negligible quantities of linseed oil. This is on account of the old established linseed crushing industry of Calcutta which is a large one and whose products compare favourably with the best of the imported brands.

(2) QUALITIES

Enquiries have shown that most of the importations are high grade boiled oils and that such imports consist largely of the products of one or two manufacturers in the United Kingdom. The imported article is invariably sold at a higher price than similar oils of Indian manufacture and oil merchants held that this is due not only to their consistently high quality but largely to the long

established footing obtained by their manufacturers in the Indian markets. As the manufacture of boiled oils has of late been taken up on an increased scale by the Indian industry it is probable that imports will continue to decline gradually.

(3) PERIODICITY

During the four months July|October imports usually contract to a marked extent owing to the monsoon which slows down building operations and virtually puts a stop to painting and exterior decorative work. For the remainder of the year there are considerable variations.

Monthly imports of Linseed Oil into India

(Thousand gallons)

—	1932-33	1933-34	1934-35	1935-36	1936-37	Average	1937-38
April	14	11	29	26	25	21	24
May	23	24	27	17	12	21	18
June	20	19	24	18	10	18	18
July	9	10	10	9	10	10	4
August	10	7	3	8	11	8	4
September	14	7	6	13	17	11	3
October	19	14	10	17	10	14	9
November	14	23	17	31	16	21	9
December	30	21	33	23	14	25	22
January	30	23	25	10	20	22	9
February	24	18	13	16	23	18	15
March	20	23	32	9	23	21	11
Total	227	200	233	199	191	210	146

F—Exports of Linseed Oil and Cake

(1) LINSEED OIL

(a) *Quantities and destinations*—During the triennium ending 1936-37 exports of linseed oil averaged about half the imports. Ex

ports of oil since 1925 26 and the share of some of the chief destinations may be summarised as follows —

Exports of Linseed Oil from India

(Thousand gallons)

	Ceylon	Straits Settle ments	Java & the Philippines	Others	Total
1925 26	5	32	16	22	75
1926 27	3	19	8	11	41
1927 28	6	26	25	16	73
1928 29	4	22	19	2	47
1929 30	5	51	32	62	170
1930 31	1	29	21	26	77
1931 32	2	13	16	7	38
1932-33	2	18	16	8	44
1933 34	6	19	24	18	67
1934 35	10	28	3	23	64
1935 36	16	35	17	10	78
1936 37	17	39	51	28	135
1937 38	15	43	23	81	162

It will be seen that exports were highest in 1929 30 and lowest in 1931 32 when industrial activity was at a low ebb, owing to the general economic depression. Since 1931 32 the export trade has shown a steady expansion and has during the past year more than doubled itself as compared with the average annual exports of the previous five years. Reference to the diagram facing page 25 will show that exports of oil follow the same general trend as exports of linseed.

Calcutta is the most important port of shipment and has handled on an average about 98 per cent. of all the linseed oil exported from India in the decennium ending 1935 36.

(b) *Quality*—While the imported oil is mainly of the boiled variety exports are chiefly in the form of raw oil. A certain amount of this trade—probably about 15 to 20 per cent.—consists of “reduced” oils *i.e.*, oils which are made cheaper by the addition of mineral oil.

(c) *Periodicity*—There appear to be no marked seasonal variations in monthly exports. The average monthly shipments based on the five year period 1932 33 to 1936 37 indicate a tendency for exports

to be highest in February and March and least in May and June, as will be clear from the following table

Monthly exports of Linseed Oil from India

(Thousand gallons)

—	1932 33	1933 34	1934 35	1935 36	1936 37	Average	1937 38
April	4	1	5	7	10	5.4	14
May	1	1	10	3	8	4.5	16
June	3	1	3	5	10	4.4	32
July	4	3	6	8	9	5.4	10
August	3	6	2	6	6	5.0	5
September	4	4	7	5	12	5.4	11
October	2	7	3	7	10	5.8	3
November	1	5	4	5	16	5.4	13
December	7	3	5	6	12	7.0	11
January	3	8	6	5	17	6.0	12
February	7	16	6	9	12	10.0	8
March	5	12	5	8	11	8.2	27
Total	44	67	64	78	135	77.6	163

As far as can be ascertained no linseed oil is shipped through Kathiawar Ports and foreign possessions in India

(2) LINSEED CAKE

(a) *Quantities and destinations*—What is left when the oil has been pressed out of linseed is known as linseed cake. The cake produced in the *ghams* is mostly consumed in the country as cattle food but practically the entire output of the modern mills, which consists of expeller and hydraulic press cake, is exported.

The following table shows the volume of the export trade from 1925 26 to 1937 38 and the share of the main consuming countries

Exports of Linseed Cake from India
(Thousand tons)

—	United Kingdom	Germany	Holland	Belgium	Others	Total
1925 26	14		4	2		20
1926 27	27	2	10	1	2	42
1927 28	34	7	20	3	4	68
1928 29	32	13	29	11	2	87
1929 30	33	3	12	2	1	51
1930 31	18		4	1	1	24
1931 32	34	3	7	3		47
1932 33	50	3	11	11	3	82
1933 34	39	1	6	4	1	51
1934 35	34		2	4	1	41
1935 36	70		1	1		72
1936 37	47		2	1		50
1937 38	44		1		2*	47

As with linseed India's best customer for linseed cake is the United Kingdom to which country 59 per cent of the total Indian exports during the eight years ending 1932-33 were consigned. The Ottawa preference came into operation in the beginning of 1933 and its effect was at once apparent inasmuch as the United Kingdom purchased 77 per cent of the total exports of Indian linseed cake during 1933-34. In the following year Great Britain's share registered a further expansion to 83 per cent, which went up to 97 per cent in 1935-36 and 94 per cent in 1936-37. From the latest available figures Great Britain's share in 1937-38 appears to be more than 93 per cent, and after adjusting "for orders" shipments, the proportion will be even higher. Shipments to other European countries have on the other hand fallen off considerably in recent years and are now of small importance †

Exports have shown great variability from year to year and while there is no consistent trend up or down it is interesting to note that shipments of linseed cake follow a tendency contrary to that shown by exports of linseed (diagram facing page 25), owing to the fact that when exports of linseed are low the amount crushed in India increases

*2 035 tons "for orders" to Egypt

†This is mainly due to quota and other restrictions on imports of feeding stuffs

Bombay and Calcutta were the only ports from which linseed cake was exported until 1933, when Vizagapatam was converted into a sheltered port capable of being used by large sea going vessels at all seasons of the year. Since 1933-34, about 4 per cent of the total linseed cake exports on an average have been diverted to Vizagapatam mainly from the mills in the Raipur (Central Provinces) area to which this port is now directly connected by rail.

(b) *Quality*—The oil contained in linseed cake varies according to the method of extraction employed. Cake produced in the old fashioned *ghani* normally contains more oil than cake turned out by efficient modern machinery such as expellers and hydraulic presses. Expeller cake is marketed in small irregular pieces roughly $\frac{1}{4}$ " thick, and usually contains about 8 to 10 per cent of oil, although these proportions are liable to variation between 6 and 12 per cent. hydraulic press cake contains about 9 to 12 per cent oil and is usually in the form of slabs about $\frac{3}{4}$ " thick, 3 feet long and 1 foot broad. It is softer than expeller cake, and costs more.

(c) *Periodicity*—From the following table it will be seen that, on an average shipments of linseed cake are lowest between March and June and moderately constant during the remainder of the year.

Monthly exports of Linseed Cake from India.

(Thousand tons)

	1932-33	1933-34	1934-35	1935-36	1936-37	Average	1937-38
April	3	5	2	3	3	3.0	3
May	3	5	2	4	3	3.4	3
June	7	4	0	4	3	4.0	3
July	9	6	4	5	4	5.6	5
August	10	7	3	7	7	6.8	4
September	10	3	4	7	7	6.2	5
October	6	4	3	9	6	5.6	6
November	6	4	3	7	3	4.6	4
December	7	3	5	7	4	5.2	4
January	8	3	5	10	3	5.8	4
February	7	4	4	5	4	4.8	3
March	6	3	4	4	3	4.0	3
Total	82	51	41	72	50	59.2	47

G—Total and net available supplies of Linseed and Linseed products

(1) LINSEED

The net quantities of linseed retained for consumption in India since 1901 are shown in Appendix XI. The total and net available supplies during the last three years is summarised below —

Net available supplies of Linseed in India

1934-35 to 1936-37

(Thousand tons)

	1934-35	1935-36	1936-37	Average	1937-38
Production (outturn of previous years crop)	458	492	478	476	475
Imports	10	14	13	12	11
Total supplies	468	506	491	488	486
Exports	240	165	296	233	226
	228	341	193	255	200
Seed requirements @ 15 lb per acre	26	26	27	26	26
Net available supplies	202	315	168	229	232

The net available supplies in earlier years were considerably less, the average for the triennium 1911-12 to 1913-14 being 138,000 tons only, i.e., about three fifths of the 1934-35/1936-37 average as will appear from the following table —

Net available supplies in pre War years

(Thousand tons)

	1911-12	1912-13	1913-14	Average
Production (outturn of previous years crop)	571	645	542	586
Imports	11	8	7	9
Total supplies	582	653	549	595
Exports	522	354	414	430
	60	299	135	165
Seed requirements @ 15 lb per acre	34	28	20	27
Net available supplies	26	271	115	138

(2) LINSEED OIL AND CAKE

Of the net available supplies of linseed after deducting exports and seed requirements, a small portion (27,000 tons or about 6 per cent of the total production) is consumed as such and the balance is converted into oil and cake yielding approximately 67,000 tons of oil or about 16 25 million gallons and 133,000 tons of cake. Adjusting imports and exports, the net available supplies of linseed oil and linseed cake during the triennium 1934 35/1936 37 amounted roughly to 67,500 and 79,000 tons respectively as detailed below —

Net available supplies of Linseed Oil and Linseed Cake

(Thousand tons)

	Linseed oil		Linseed cake	
	Average 1934 35 to 1936 37	1937 38	Average 1934 35 to 1936 37	1937 38
Production	67	68	133	137
Imports	0 6	0 6	Nil	Nil
Total supplies	67 8	68 6	133	137
Exports	3	0 6	54	47
Net available supplies	67 5	68	79	90

H—Note on the trade in linseed and its products in Burma.

Apparently no linseed whatever is grown in Burma except on the farms of the agricultural department. The Season and Crop Reports for the six year period 1928 29 to 1933 34 showed an average of 26 acres as being under linseed, but on investigation the crop thus reported proved not to be linseed.

Linseed is imported into Burma in negligible quantities for veterinary purposes only. Consignments of 2 to 5 bags at a time are ordered by local produce dealers from commission agents in Calcutta or from their own branches where such exist in the same city. The retail trade secures its supplies at the rate of one or two bags at a time and sells to the ultimate consumer in small units varying from $\frac{1}{4}$ lb to 3 lb.

Burma obtains her requirements of linseed oil by importing from India and from foreign countries. The present extent of this trade which is detailed in the following table is of the order of about 110 000 gallons of which at the present time, less than about 2 per cent derives from sources other than India.

Imports of Linseed Oil into Burma from other countries and from India

(Gallons)

	Average 1929 30 to 1931 32	Average 1932 33 to 1934 35	1935 36	1936 37	1937 38
Imports from abroad	7 100	4 200	1 800	1,200	2,100
Imports from India	122 000	102 000	107,000	118,000	105 000

It will be noticed that imports of oil from abroad have very largely diminished and in 1936/37 were only about one sixth of the average of the three years 1929/30 to 1931/32. Imports from India in 1936/37 however remained lower than those in the triennium referred to, although the share of India in the total imports into Burma has steadily increased. Of the total quantities of linseed oil imported into Burma from other countries and from India India's share was 94 per cent in the triennium 1929/30 to 1931/32, 96 per cent in the following three year period 1932/33 to 1934/35, 98 per cent in 1935/36, 99 per cent in 1936/37, and 98 per cent in 1937/38.

INTER CHAPTER ONE

The linseed crop in India is grown for its seed and not for the fibre. Somewhere about $4\frac{3}{4}$ lakhs tons of linseed are produced on an area of about 4 million acres, and the area shows a tendency to increase. The production is concentrated mainly in the Central Provinces, United Provinces, Bihar, Hyderabad, Bombay and Bengal.

The total value of the linseed produced is somewhere about 5 crores rupees. Since only about 20 per cent is retained in the villages linseed constitutes an important cash crop. Almost half the crop is sold in the harvest months, March, May. Linseed is also an important factor in the export trade since sometimes almost two-thirds of the total crop is exported, the post war average exports being well over 2 lakhs tons annually. Apart from the exports of linseed cake, the average annual value of which was about 33 lakhs, there are also exports of linseed oil amounting to one lakh gallons valued at about $1\frac{1}{2}$ lakhs rupees, but this is more than counterbalanced by imports of linseed oil which are more than twice the exports and are valued at about 4 lakhs rupees.

The net available supply for consumption within India averages over $2\frac{1}{2}$ lakhs tons after allowing for seed required for sowing. This is converted into oil and cake either in country bullock driven *ghanis* or in the larger power mills. Some of the oil is put to industrial use in the preparation of paints and varnishes, etc., but its main use is for edible purposes either as linseed oil which is very much in favour in the Central Provinces and Central India States, or as an adulterant of higher priced oils such as mustard oil which is in keen demand in Bengal, United Provinces, Bihar and Orissa.

The oil content depends very largely on the type of seed. The main commercial descriptions are Bold and

Small seed Bombay Bold, it is found, normally consists of linseed having less than 135 grains per gramme. In the case of Calcutta Bold the seed is smaller and ranges from 145 up to 153 grains per gramme, at which point it ceases to be called Bold and becomes Small. Of the total production about 40 per cent consists of Bombay Bold, less than 10 per cent of Calcutta Bold and rather more than half of Calcutta Small. In general the small type of seed is found in the Gangetic Plain and in Bengal the grains frequently number 200 or more per gramme. In parts of the Central Provinces the general level is about 120 grains per gramme, and in some of the Central India States 110 grains or less per gramme.

Laboratory analysis shows that within limits, the larger the seed the higher the percentage of oil. Samples drawn from Central India, with 112 grains per gramme show an oil content of $45\frac{1}{2}$ per cent, whereas some samples of small linseed in Bengal give a figure as low as $38\frac{1}{4}$ per cent. The larger the grain the higher the oil content holds good as a general principle until the number of grains becomes less than 105 per gramme, when apparently the size of the seed becomes affected by a thickening and coarsening of the seed coat and no increase in oil content can be observed.

It will appear later that the trade and particularly the buyers abroad do not appreciate as fully as might be expected the inherent value of the "bold" seed. There is, therefore, some need to standardise the different types so as to secure an adequate premium for the higher qualities.

When taking up the standardisation of quality the question of the percentage of impurities would also have to be considered. This varies from one district to another and whereas it averages about $5\frac{1}{2}$ — $6\frac{1}{2}$ per cent in Central India the amount of impurities increases to between $8\frac{1}{2}$

and 10 per cent in Bihar and in some parts of the United Provinces is as high as $11\frac{1}{2}$ per cent, largely owing in this case, to the prevalent practice of sowing linseed with wheat and other grains

The position in regard to the export trade depends very largely on the Argentine crop. Indian linseed is distinctly better than Argentine both in regard to its oil content and drying properties, but the Argentine dominates the world markets owing to the fact that it produces about two thirds of the world crop and controls rather more than 80 per cent of the world trade. Indian production represents about 16 or 17 per cent of the world total and she holds about the same proportion of the world trade. It is perhaps not surprising that buyers abroad tend to base their business to a very large extent on Argentine linseed and this is true even of buyers in the United Kingdom who have, since the introduction of the Ottawa Agreement, taken on an average about two thirds of the total exports of linseed from India and about four fifths of the linseed cake.

It would appear that as a result of the increased takings by the United Kingdom of Indian linseed there has been some increase in the production, this is however largely obscured by the very high error which exists in official statistics. As in the case of other crops the "standard yield" which ranges in different provinces from 215 lb to 500 lb is open to considerable doubt and the All India average based on official figures which amounts to only 275 lb per acre, i.e., less than half the average yield in the Argentine under states the case considerably. The official statistics make no allowance for what appears to be the increasing practice of sowing linseed mixed with other crops. This is the source of additional errors. Allowing for the fact that 10 per cent of the linseed area which lies in unreporting Indian States, finds no place in the official records, these various

errors result in a cumulative total under-estimation in the official figures which must at least be 10 per cent. in area and 17 per cent. in production, and is probably considerably higher. It would obviously be desirable to take some steps to reduce the extent of this error.

CHAPTER II—UTILISATION AND DEMAND

A—Utilisation

The absence of statistical data has been a serious difficulty. No information is available to show the amount of linseed utilised in the manufacture of oil and cake, or the crushing capacity of the mills or the country *ghanis*. In spite of extensive personal enquiries, therefore, the figures discussed in the succeeding sections must be regarded as approximations only.

(1) FOR EXPORT

Taking an average of the three years 1934-35 to 1936-37, India's exports amounted to 233 000 tons annually representing 49 per cent. of the total production.

(2) FOR INTERNAL CONSUMPTION

The country's requirements may be summarised as under—

(a) Seed,

(b) Domestic consumption *e.g.*, for edible and medicinal purposes and as cattle feed, and

(c) Oil extraction

(a) *Seed*—The seed rate varies in different areas as detailed in Chapter XI but at an average of 15 lb per acre nearly 26 000 tons of linseed were annually required for this purpose during the past three years. Locally grown seed is almost invariably used irrespective of quality considerations.

(b) *Domestic consumption*—In a few localities as for instance in the eastern parts of the United Provinces and in the Punjab small quantities of linseed are used for the preparation of a kind of sweetmeat known in the vernacular as *pin*. These are made up in the shape of small balls and consist of a mixture of *gur* or jaggery (raw cane sugar) and linseed.

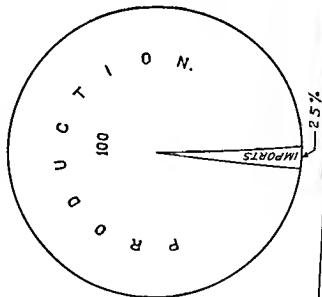
Linseed is also used occasionally in cattle feed as a "conditioner". In the towns and cities it is fed to race horses and polo ponies and is also in some demand in veterinary establishments. In addition to these various uses a certain amount of linseed is consumed in the rural and urban areas as an ingredient in medical preparations and in poultices.

Of the 47 000 tons estimated to be retained in the villages for domestic consumption (excluding the requirements of the village *ghanis*) about 26 000 tons are utilised for sowing leaving some 21 000 tons to be consumed in the countryside. In the urban areas the *per capita* disappearance has been ascertained to be relatively higher and accounts on an average for about 6 000 tons per annum. A total of some 27 000 tons is therefore consumed for these various purposes as linseed.

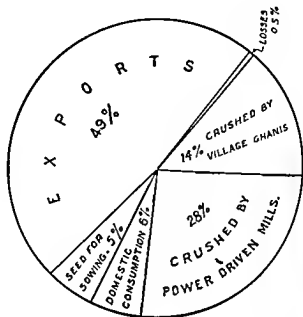
SUPPLIES AND UTILISATION OF LINSEED IN INDIA.

AVERAGE 1934-35/1936-37

SUPPLIES.



UTILISATION.



(c) *Oil extraction*—The crushing of linseed for the manufacture of linseed oil (and linseed cake) is an important industry and is responsible for the greater proportion of the linseed consumed in India. Altogether, about 42 per cent of the total production on an average or roughly about 200,000 tons annually, were used for the expression of oil between 1934-35 and 1936-37*.

In the country side the oil is expressed by *ghanis* or *kolhus* operated by draught animals such as bullocks but in many towns and cities there are power driven mills equipped either with rotary *ghanis*† or with modern machinery such as expellers and hydraulic presses‡ (the location of these power driven plants is shown in the map facing page 44).

Between 1934-35 and 1936-37, of the 200,000 tons estimated to have been crushed annually, about 134,000 tons were handled by the power driven mills and 66,000 tons by the village *ghanis*.

(3) SUMMARY OF UTILISATION

The approximate utilisation of the linseed crop, in round figures, between 1934-35 and 1936-37 is summarised in the following table. The proportionate disappearance through the various channels of consumption is illustrated in the diagram opposite.

Summary of utilisation of Linseed in India

Supplies (excluding carry overs)		Utilisation	
(Tons)		(Tons)	
Average production	476 000	Average exports (1934-35/1936-37)	233 000
Average imports	12 000	Seed	26 000
		Domestic consumption	27,000
		Oil extraction	200 000
		Wastage, etc	2,000
Total available supplies	488 000		488 000

B—Demand

(1) QUALITY REQUIREMENTS

Consumers' requirements in respect of linseed are not as complex as is the case with certain cereals such as wheat or rice. As linseed

*The methods adopted in arriving at this figure are discussed in detail later in this chapter.

†Similar in principle to the village *ghanis*, but operated by mechanical power.

‡See page 206.

is primarily needed for the expression of oil the main consideration apart from cleanliness is the amount of oil that can be obtained. The quality of the oil has so far not been taken into consideration and among the three main commercial qualities of Indian linseed—Bombay Bold Calcutta Bold and Small—the difference is only of size of grain and oil content. The premiums paid for the bold types are based on the extra oil content only.

Indian linseed is not only higher in oil content by about 4 per cent as compared with Argentine linseed but oil from Indian linseed is understood to have better drying properties which enhance its value. Accordingly it enjoys a premium over Plate linseed in world markets although the amount of this premium is liable to considerable variation in different years.

(a) *For export*—Normally almost all the linseed exported from India is employed in the preparation of oil for industrial uses such as the manufacture of paints varnishes linoleum etc and the export demand is not confined to any particular quality. The price factor i.e. the relative values of the small linseed exported through Calcutta and the bold linseed shipped from Bombay wholly determines the buying policy of the exporting houses supplying linseed to the United Kingdom and Continental millers. In recent years however it has been observed that whenever the United States is in the market for Indian linseed a definite preference is given by American buyers to Bombay Bold. This is largely due to the fact that freights to the Atlantic coast sea ports in the United States are usually cheaper from Bombay than from Calcutta and when reckoned in terms of oil they work out still lower owing to the higher oil content of Bombay Bold.

An examination of the exports of linseed from Calcutta and Bombay shows the relative extent of shipments of different qualities of linseed. Exports from Calcutta consist predominantly of small linseed* while those from Bombay are largely of the Bombay Bold variety. During the quinquennium ending 1929-30 nearly 58 per cent of the total exports from India went out from Calcutta and about 42 per cent from Bombay while in the next 5 year period ending with 1934-35 exports from Calcutta declined to less than 53 per cent and those from Bombay rose to about 46 per cent indicating a higher proportion of Bombay Bold. This was due to the fact that the U S A had come into market for Indian linseed and had bought fairly extensively in 1933 and 1934. During the latter year about 14 per cent of the total Indian exports went to America as compared with 0.2 per cent in the preceding five years. In 1935-36 about 50 per cent of the Indian export trade was concentrated at Calcutta and 46 per cent at Bombay. In 1936-37 however Bombay took the lion's share of the export trade with 57 per cent leaving Calcutta with only about 41 per cent. This was mainly

*Probably less than 5 per cent of the total exports from Calcutta conform to the Calcutta Bold standard.

due to the parity favouring Bombay and the increased retention in the areas serving Calcutta. The position was reversed during 1937-38, when Calcutta handled about 60 per cent of the total amount shipped from India, Bombay only 40 per cent, and Vizagapatam the remaining 5 per cent.

(b) *For internal consumption*—Generally speaking, the Indian oil milling industry has little choice in the type of linseed used. Geographically, the areas producing the different qualities of linseed are fairly clearly demarcated, and as the mill generally draws its supplies from the nearest area of surplus production, the location of the mill is the main factor in determining the quality crushed. Mills procuring their supplies from the north of the United Provinces, Bihar, Bengal etc., obviously do not obtain linseed of the Bombay Bold class whereas the mills in Western India receive an insignificant proportion of small linseed. It is only in the comparatively few localities in which more than one class of linseed is economically available, that the question of any preference for any particular quality can arise. For example, at Calcutta where both the Calcutta Bold and Small qualities are traded in regularly the local mills definitely prefer the former quality not only because of its higher oil content but also because of its comparatively greater cleanliness as compared with the small linseed produced in Bihar and the United Provinces. As, however, supplies of hold linseed reaching Calcutta are inadequate the mills are obliged to purchase relatively large quantities of small linseed and owing to lack of sufficient storage accommodation in many instances both qualities are stacked together in the same godowns and are crushed indiscriminately. To some extent this would appear to account for the fact that the premium actually paid for hold linseed in Calcutta is seldom commensurate with its higher oil content.

The owners or operators of *ghanis* and *kolhus* crush whatever kind of linseed they can obtain most conveniently and cheaply. Normally their supplies are drawn from the immediate neighbourhood irrespective of quality.

Special quality characteristics in regard to size or oil content are therefore not given adequate consideration at present in the linseed consumed in India.

(2) QUANTITATIVE REQUIREMENTS

Excluding the total requirements of the export trade and the amount of linseed needed for seed and domestic consumption the largest quantities are consumed in the extraction of oil. The demand for this arises from two main sources

(a) *Power driven mills*

In the absence of statistics the quantity consumed by the milling industry can at best be only a rough estimate. There being over

550 oil mills* it was not an easy matter to collect information as to their requirements of this oilseed. Of these establishments about 430 do not crush any linseed at all and of the 123 concerns which were ascertained to have crushed linseed during 1936-37 only a few handle linseed exclusively while the great majority crush other oil seeds as well as linseed.

An attempt was made to ascertain the quantity of linseed crushed by issuing a questionnaire to every known concern. This was supplemented by personal enquiries wherever possible. A number of the large establishments readily complied but the response from numerous small concerns was not encouraging. Some apparently possessed no records while others were chary of giving any detailed information.

It was necessary, therefore, to attack the problem from another angle. Information obtained from a number of mills, and the results of other enquiries indicated the proportions of linseed cake exported and consumed locally. From this it became possible to estimate the production of cake from the detailed export statistics available. The total amount of linseed crushed in the country could thus be calculated. The fact that almost all the cake turned out by hydraulic presses and expellers is exported while the production of cake from rotary *ghanis* is consumed locally, helped materially in achieving this object.

The linseed cake production of the oil mills in Bengal, Bihar and the United Provinces is exported from Calcutta while the output of the mills in the Central Provinces, Central India, Rajputana, Bombay and Hyderabad is shipped through Bombay†. The Punjab and Kashmir do not export any linseed cake. The position may therefore be conveniently examined under the following 3 groups—

- (i) *Areas exporting cake through Calcutta*—United Provinces, Bihar, Orissa and Bengal.
 - (ii) *Areas exporting cake through Bombay and Vizagapatam*—Central Provinces, Central India, Rajputana, Hyderabad and Bombay.
 - (iii) *Areas which do not export cake*—Punjab and Kashmir.
- (1) *Areas exporting cake through Calcutta*—United Provinces, Bihar, Orissa and Bengal.

United Provinces—Out of 61 mills operating in the province 27 crush linseed in quantities which vary from year to year. Most of

*According to the publication 'Large Industrial Establishments in India' issued by the Department of Commercial Intelligence and Statistics the last edition of which appeared in 1935 there were 250 oil mills in the different Provinces and States in India in 1933. During the course of this survey however it was found that some of the mills recorded in the above-mentioned publication had gone into liquidation while others had come into existence. There were also numerous smaller concerns of which a record was obtained for the first time. From data collected during the present survey it appears that there were at least 550 oil mills working in India in 1936; the location and distribution of which is dealt with more fully in Chapter X.

†In recent years small quantities of cake from the Central Provinces have been consigned from Vizagapatam.

these establishments also handle other oilseeds. Broadly speaking, much of the cake turned out by expellers and hydraulic presses is consigned to Calcutta, mainly for commission sale to shippers, while the product of the rotary *ghanis* is sold and consumed locally.* Taking the United Provinces as a whole, enquiries show about 60 per cent of the cake produced is at present consumed within the province or in adjacent areas. The remaining 40 per cent is consigned to Calcutta and eventually shipped abroad.

From data collected from almost all the linseed crushing mills in the province the total quantity crushed in 1934-35 was estimated at 19,000 tons of which the Cawnpore mills handled about 7,000 tons, the mills at Agra and Jhansi about 2,000 tons, those at Benares 4,000 tons and the mills at other centres approximately 6,000 tons.

Bihar—There are some 38 mills in this province of which 26 are reported to crush linseed. A few of the mills are equipped with expellers or presses but the majority operate batteries of rotary *ghanis* and are primarily concerned with the crushing of mustard and rapeseed. About 80 per cent of the linseed cake produced in this province—the output of rotary *ghanis*—is consumed locally. The balance of 20 per cent, representing the great bulk of the expeller cake output, finds its way down to Calcutta where it is sold to exporters through commission agents. The quantity of linseed estimated to be crushed by the large mills in this province during 1934-35 was about 15,000 tons.

Bengal—Linseed crushing in Bengal is concentrated at or in the immediate vicinity of Calcutta and is a highly developed industry in this province. Of the 44 mills working in the province, 9 crush linseed, and of the latter at least two work all the year round on linseed exclusively. These mills are all equipped with modern machinery consisting of expellers and hydraulic presses.

There are fewer variations in the quantities of linseed crushed from year to year in Bengal than in either Bihar or the United Provinces. The actual records of 3 large mills, including one dealing exclusively with linseed, showed that during the 4 calendar years 1932-35 a little more than 12,000 tons was consumed annually on an average, the range of variation being from 10,460 tons in 1934 to 13,198 tons in 1935. Altogether about 25,000 tons were crushed in Bengal during 1934-35, almost the whole of the cake produced therefrom being destined for the export market.

*It is noteworthy that the local consumption of linseed cake appears to be on the increase in the eastern districts of this province. This may in part be due to the fact that in recent years several parcels of linseed cake deriving from this province and shipped from Calcutta to the United Kingdom, were rejected on arrival at destination owing to the presence of castor seed or husk (see Chapter X). For this reason exporters avoid purchasing linseed cake produced in the United Provinces except under special terms. The mills therefore prefer to sell their cake locally as they find the terms of local sale less onerous. A few reputable manufacturers however still export the whole or a large part of their output of expeller and press cake.

The following table therefore summarises the position in the areas served by Calcutta —

Estimated production retention and export of Linseed Cake relating to the areas served by Calcutta

	Linseed crushed in 1934 35 (tons)	Cake produced (tons)	Proportion of cake estimated to be con- sumed locally	Quant ty of cake consumed locally (tons)	Quantity of cake available for export (tons)
United Provinces	19 000	12 700	60%	7 620	5 080
Bihar (including Orissa)	15 000	10 000	80%	8 000	2,000
Bengal	23 000	16 700			16 700
	59 000	39 400	39%	15 620	23 780

It will be observed that out of a total estimated production of 39 400 tons of cake in 1934 35 15 620 tons are reckoned to have been consumed within the country (largely within the areas of production themselves) leaving a calculated surplus available for export approximating the actual exports of linseed cake from Calcutta in 1934 35 viz, 23 216 tons

(1) *Areas exporting cake from Bombay (including Vizagapatam) — Central Provinces Central India, Rajputana, Bombay and Hyderabad*

Central Provinces—Linseed oil is greatly in vogue as an edible oil in this province and most of the local mills crush linseed either exclusively or in conjunction with other oilseeds such as groundnuts sesamum etc. Of the 64 mills in the province at least 41 have been crushing linseed in recent years. Statistics furnished by 12 mills show that 58 648 tons of linseed were crushed in the five years 1930 31 to 1934 35 which is equal to an annual average of 11 729 tons. Having regard to the estimated capacities of the other mills the total quantity of linseed crushed in this province during the 5 years ending 1934 35 may be taken roughly as 40 000 tons per annum.

About 44 per cent of the total cake production is estimated to be retained within this province.

Bombay—The crushing of linseed is undertaken by only 8 of the 69 mills in the province and is mostly concentrated in the city of Bombay. The total amount of linseed crushed annually during the five years ending in 1934 35 is estimated at 9 000 tons.

Hyderabad Central India and Rajputana States—The oil mills in Hyderabad are chiefly concerned with groundnuts only 3 of the 81 mills in the State crushing linseed. The total average yearly

consumption is estimated not to exceed 1,500 tons. In Central India, appreciable quantities of linseed are crushed in the States of Indore and Gwalior, while Kotah, in Rajputana, is also of some importance. The total quantity of linseed handled by the mills in these three areas is estimated to be in the neighbourhood of 5,000 tons annually. As in the Central Provinces, about 44 per cent of the total cake output of the mills is consumed locally and in adjacent tracts.

The situation in the areas served by Bombay and Vizagapatam may therefore be summarised as follows —

Estimated production, retention and exports of Linseed Cake relating to the areas served by Bombay

	Linseed crushed annually during the quinquen- nium ending 1934-35	Cake produced	Proportion of cake estimated to be consumed locally	Quantity of cake consumed locally	Quantity of cake available for export
	(tons)	(tons)		(tons)	(tons)
Central Provinces	40 000	26 700	44%	11 750	14 950
Bombay	9 000	6 000			6 000
Hyderabad	1,500	1 000	44%	440	560
Central India and Rajpu- tana States	5 000	3 300	44%	1,450	1,850
	55,500	37,000	37%	13 640	23,360

With an estimated local consumption of 13,640 tons out of a total production of linseed cake amounting to 37,000 tons the balance available for export works out at a figure approximating the actual exports of linseed cake from Bombay and Vizagapatam over the five years ending 1934-35 which averaged 23,330 tons annually.

(iii) *Areas which do not export cake abroad — Punjab and Kashmir*

The cake produced from the linseed crushed in the Punjab and in Kashmir is all consumed locally and is not exported outside these areas. In Kashmir, the consumption by mills is estimated to be about 3,000 tons. In the Punjab, a certain amount of linseed crushing is done by power driven *ghams* but the quantities involved are small, and are apparently in the neighbourhood of 200—250 tons annually. The total quantity of linseed crushed each year in these two areas may be reckoned not to exceed 4,000 tons.

(iv) *Total requirements of the power driven mills*

As has already been mentioned exports of linseed cake from Calcutta represent some 61 per cent of the total cake production

of the United Provinces Bihar, Orissa and Bengal while exports from Bombay and Vizagapatam jointly account for about 63 per cent of the total amount of linseed cake produced in the Central Provinces, Central India, Rajputana, Hyderabad and Bombay. On this basis, the total production of linseed cake in these areas during the past three years would appear to be somewhat as follows —

Total estimated production of Linseed Cake in India
(Tons)

	Exports of cake		Production of cake		Total production of cake
	from Calcutta	from Bombay	in the United Provinces Bihar Orissa and Bengal	in the Central Provinces Central India Rajputana Hyderabad and Bombay	
1934 35	23 000	17 000	38 000	27 000	65 000
1935 36	44 000	28 000	72 000	44 000	116 000
1936 37	25,000	25 000	40 000	40 000	80 000
Average	31 000	23 000	50 000	37 000	87,000

As 3 tons of linseed yield approximately 1 ton of oil and 2 tons of cake under ordinary conditions of commercial production, the linseed required for the production of 87 000 tons of cake the average for the three year period referred to in the above table, would amount to about 130 000 tons.

Adding to this figure the 4,000 tons estimated to be crushed in the areas not exporting cake it will be seen that 134 000 tons of linseed were on an average handled by the power driven mills annually during the three year period ending 1936 37.

(b) *Village ghanis*

The extent of the demand from these indigenous plants is much more difficult to estimate. Their numbers are generally unrecorded and even where such information exists it cannot be regarded as very reliable. Again the size and the crushing capacity of the *ghanis* vary in the different districts. A further difficulty arises in that the period devoted to linseed crushing depends on a number of factors such as the locality the season of the year the production of linseed in relation to other oilseeds and finally, the prices of other vegetable oils.

United Provinces—In this province the census of livestock and agricultural machinery published in 1935 gave the total number of bullock driven *ghanis* as 147 733. In the western United Provinces no linseed is apparently handled by the *ghanis*. In the central and eastern parts however a certain amount of linseed is so

crushed in addition to the other main oilseeds of these areas. Personal enquiries made in the various districts of this province would seem to indicate that approximately 15 000 tons of linseed are crushed in the *ghanis* in an average year

Bihar and Orissa—The number of *ghanis* operating in this area is unrecorded. It was ascertained however that linseed crushing by *ghani* takes place to a greater extent in the producing areas in the north eastern and southern districts than in other parts of the province. The provincial report estimates the average annual consumption by the *ghanis* at about 13 000 tons a figure subject to variation from year to year according to the relative prices of mustard or rape oil and linseed oil

Central Provinces—Published records show that there are 18 551 *ghanis* in this province. The present survey has shown that about 5 000 of these crush linseed the annual consumption being in the vicinity of about 17 000 tons

Other Provinces and States—In Assam Bengal and Madras there appear to be no instances of linseed being crushed by *ghanis*. In the Punjab linseed crushing is confined mainly to the districts of Kangra Gurdaspur and Hoshiarpur and involves about 1 700 tons. In Kashmir about 1 500 tons appear annually to be crushed in the *ghanis*

As regards the Indian States linseed crushing by *ghanis* is not the practice in Hyderabad but is a somewhat important factor in the Central India and Rajputana States. The estimated quantity of linseed crushed in Gwalior Dhar Narsingarh Chhattarpur Nagod Rewah etc. amounts to about 18 000 tons

Summary of consumption by ghanis—An estimation of the annual variations in the amount of linseed handled by the *ghanis* cannot be made in the same manner as has been possible in dealing with the power driven mills. Apart from the impossibility of obtaining details from the three or four hundred thousand *ghanis* scattered all over the country the bulk of the oil and all the output of cake is consumed locally so that no proper records are available. The total given in the statement below must therefore be regarded as a rough average figure only subject it may perhaps be assumed to yearly variations in like proportion to the power driven mills consumption of linseed

Approximate quantity of Linseed estimated to be crushed by ghanis annually

	<i>Tons</i>
United Provinces	15 000
Bihar (including Orissa)	13 000
Central Provinces	16 500
Central India and Rajputana	18 000
Punjab	1 700
Kashmir	1 500
Total	65 700

(c) *Summary of total utilisation of Linseed for oil extraction in India*

From what has already been said it would appear that the average annual requirements for both power driven mills and village ghanis for the triennium 1934-35/1936-37 were roughly as follows—

	<i>Tons</i>
Power driven mills	134 000
Village ghanis	66 000
Total linseed crushed	<u>200 000</u>

Assuming the proportion of oil extracted to be approximately one third by weight of the quantity of linseed crushed the total amount of oil manufactured annually on an average during the above period would be nearly 67 000 tons equivalent to some 16·25 million gallons

(3) **FACTORS AFFECTING THE DEMAND**

(a) *For export*—As already indicated in an earlier section the export demand to a very large extent is influenced by the size of the Argentine crop (diagram facing page 56). The production in the United States also has some bearing on the export demand for Indian linseed. The United States is a producer of linseed but has frequently to supplement her domestic supplies with imports which are necessarily larger in years when her own crop is deficient. The great bulk of such imports is normally drawn from Argentina but in years of exceptionally short crops—particularly when a small crop is simultaneously harvested in the Plate—a demand is created in the United States for the linseed grown in India the only country in the world other than the Argentine having an exportable surplus of any magnitude. This has actually happened in more than one season since 1933.

Another factor which has a direct bearing on the volume of the Indian export trade is the premium at which Indian linseed can be purchased abroad as compared with Plate linseed. This is governed to a great extent by the size of the latter crop. In years of abundant supplies of Argentine linseed the differences between the quotations for Indian and Plate linseed naturally tend to widen until a point is reached at which it pays to buy the latter quality having due regard to the adjustment of such factors as (i) the difference in the London selling basis which according to the Incorporated Oil Seed Association Contract is 'pure' for Indian linseed and 4 per cent for Plate (ii) the relative amount of oil content and (iii) for sales in the United Kingdom the 10 per cent import duty which is levied in that country on linseed of non-Empire origin. The other and least tangible element, also probably the most important is the market factor which coupled with the known constants enumerated above goes to make up the extremely variable price differences between Indian and Plate linseed. It is impossible therefore to determine a fixed point at which both Indian

and Argentine linseed are an equally good "buy". The question is discussed in a more appropriate chapter dealing with prices.

In a general way, however, it may be said that Indian linseed is intrinsically worth about 15 per cent more than Argentine, having regard to the basis of price quotations in London and their oil content. It is significant therefore that whenever the premium has approached this proportion or has fallen below it, large exports of Indian linseed have resulted. Further, the narrowing down of the premiums usually synchronises with a small Argentine crop. The size of the Indian crop bears little or no relation to the volume of linseed exports from India. All these features will be observed from the following table and in the diagram facing page 56 —

Comparison of premiums for Calcutta over Plate Linseed and exports from India

	Premium for Calcutta linseed over Plate linseed c : f London		Argen- tine production	Indian pro- duction (previous years crop)	Exports from India	Percentage of exports from India to produc- tion
	Per ton	Percentage of Plate price	Million tons	Thousand tons	Thousand tons	
	£ s d					
1927-28	1 19 2	12	2 20	473	223	47.2
1928-29	2 14 10	17	2 06	422	157	37.2
1929-30	1 13 10	9	1 95	401	248	61.9
1930-31	2 2 6	16	1 25	442	257	58.2
1931-32	2 4 9	25	1 95	440	120	27.3
1932-33	1 17 6	22	2 22	476	72	15.1
1933-34	1 4 2	12	1 55	504	383	76.0
1934-35	1 12 11	16	1 56	458	240	52.4
1935-36	2 1 5	20	2 00	492	165	33.5
1936-37	1 18 8	17	1 40	478	296	61.9
1937-38	1 17 9	15	1 82	475	226	47.6

(b) *For internal consumption*—The demand for linseed for internal consumption is subject to a number of somewhat complex factors. Apart from the relatively small quantities which are required for sowing and domestic consumption the bulk of the linseed retained in the country is required for the production of linseed oil. Consequently the demand for linseed depends on the demand for its oil. In the western countries linseed oil is primarily regarded as an industrial oil except on the comparatively rare occasions when on account of its exceptional cheapness as compared with other vegetable oils, it attracts the attention of refiners for the edible trade. In India, however, it is much used for edible purposes not only in its pure state but as an adulterant in other vegetable oils.

No statistics whatever are available regarding the quantities of linseed oil utilised in the manufacture of paints, varnishes or for

other industrial purposes, but from enquiries made during this survey it is estimated that not more than one third of the total production of linseed oil or about 5.3 million gallons equivalent to some 22,000 tons is consumed in industrial requirements. The remaining two thirds amounting to 11 million gallons or nearly 45,000 tons is utilised for edible purposes, either pure or in admixture with other oils.

Linseed oil, as such, is one of the principal edible oils in the central parts of India, notably the Central Provinces. Its demand therefore is fairly constant in these tracts. In Northern India—Punjab, the United Provinces, Bihar and Bengal—where mustard and rape oils are the chief edible oils, linseed oil is only used for mixing with the former when the relative price factors are favourable. The quantities used in such admixture are subject to constant fluctuations from month to month and year to year according to the relative prices of other adulterant oils.

In this respect groundnut oil is the greatest competitor of linseed oil as both are suitable for admixture with mustard oil. The pungency of the latter overcoming the comparatively bland characteristics of the two oils. The choice between the two depends therefore, on their relative cheapness. The demand for linseed oil increases or decreases according as the margin between the prices of linseed oil and that of the other two oils widens or contracts. The demand for adulteration purposes is accordingly elastic in the extreme and liable to considerable variation.

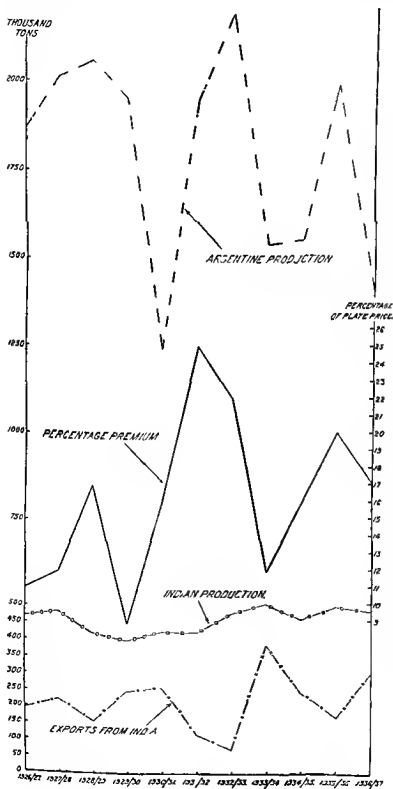
The following table which gives the average annual prices of mustard, groundnut and linseed oils at Calcutta from 1931-32 to 1936-37 shows the relative prices of these oils in different years—

Average annual prices of Mustard, Groundnut and Linseed Oils at Calcutta (ex mill)

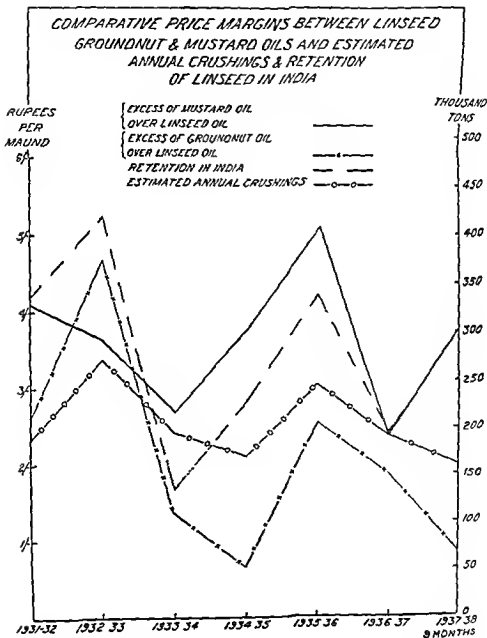
(Per maund)

	Mustard oil	Linseed oil	Ground nut oil	Excess of mustard oil price over linseed oil	Excess of groundnut oil price over linseed oil
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1931-32	14 6 4	10 4 8	12 15 0	4 1 8	2 10 4
1932-33	12 14 8	9 4 4	13 15 6	3 10 4	4 11 2
1933-34	11 0 2	8 5 0	9 11 0	2 11 2	1 6 0
1934-35	13 2 8	9 6 4	10 0 10	3 12 4	0 10 6
1935-36	15 0 2	10 14 6	13 7 10	4 1 8	2 9 4
1936-37	14 2 4	11 12 2	13 10 4	2 6 4	1 14 2
1937-38	16 15 0	13 2 0	13 15 6	3 13 0	0 13 6

Premium for Calcutta linseed over Plate linseed at London, exports from India and production of linseed in India and Argentina



Note.—The Argentine crop harvested in 1925 26 (Nov to Jan) and Indian crop harvested in 1926 (Feb to April) have been plotted against Indian exports of 1926 27 (April March) and so on



The differences between mustard and linseed oil and groundnut and linseed oil are illustrated in the diagram facing this page together with the quantities of linseed retained annually in India and the amount estimated to be crushed in each year. It will be seen that there is a striking relation between these differences and the demand for linseed oil, and consequently, the quantity of linseed required for internal consumption. Whenever the differences widen, indicating that linseed oil is relatively the cheapest of the three the retention and consumption of linseed rises, when opposite conditions arise, more linseed is available for export.

(4) PERIODICITY

The periodicity of exports has already been discussed in Chapter I. As regards the internal consumption, enquiries show that larger quantities of linseed are used for domestic consumption in the winter months than in other parts of the year, but there appears to be no very marked periodicity in the quantities used for oil extraction. The village *ghanis* as a rule, crush more linseed in the three months following the harvest, but the demand from the power driven mills shows no definite seasonal features though there must obviously be a natural tendency on their part to buy and store linseed (if godown accommodation is sufficient) between March and May when supplies are most abundant and prices usually at their lowest. For this reason monthly figures given by a few of the large mills show that purchases and actual crushings seldom synchronize although many small mills are compelled to buy linseed from day to day to meet the demand for oil as they do not possess enough godown space and cannot accumulate supplies of the raw material when the market is favourable.

As an example of the variation in annual crushing the output of a single mill between February and April in 1934 amounted to 40 per cent of the full year's output, while in the next two seasons the amount of linseed crushed in the same period decreased to 28 and 26 per cent. Any number of similar instances could be cited.

(5) TREND

The trend of the export demand which has already been discussed indicates that the quantities available for consumption in India differ very widely from year to year confirming the variability of the demand for internal consumption. From the data already quoted in this chapter it seems clear that there is no consistent trend in the demand for linseed one way or the other. The actual figures of annual crushings in a number of mills, given in the table on the next page, also lead to this conclusion and show that the consumption of linseed in this country is expanding if at all very slowly. Having regard to the small quantities of linseed oil imported it would appear that the present production in India is sufficient for all normal requirements leaving ample supplies for the export market whenever needed.

Consumption of Linseed by certain large mills

(Tons)

	1931 32	1932 33	1933 34	1934 35	1935-36.
Mdl A	9,350	7,550	7 300	8 500	7 800
B	2 500	2 300	2 400	2 634	2 422
C	2 473	2 296	1 982	1 792	3 054
D	3 172	3 601	1 369	3 571	3 843
E	1 487	2 686	2 670	2 622	2 834
F	892	1 724	1 164	1 148	1 100
G	890	1 088	723	530	883
Total	20 764	24 295	17 608	20 797	21 936

(6) INTER-PROVINCIAL TRADE

A good indication of the demand for linseed in the different provinces and States is provided by the movement of the crop from one area to another (See map facing page 66) It has been mentioned earlier that the linseed producing areas lie in the United Provinces Bihar Central Provinces, Bengal, Bombay Hyderabad and Central India and Rajputana States These tracts retain a proportion of their production for seed domestic consumption and for crushing into oil the surplus being exported to other provinces or to the ports for shipment abroad Although movement takes place by rail river and road the great bulk of such traffic is carried by rail and may therefore be taken as a fair index of the trade between different provinces and States This is summarised in Appendices XII and XIII

On an average for the three years 1934 35 to 1936 37 the United Provinces retained 52 per cent annually Bihar 27 per cent and the Central Provinces 77 per cent of their respective productions The comparatively large internal requirements of the Central Provinces are met by local production as well as by small importations from the adjacent tracts in Hyderabad and Central India The United Provinces' demand is met by linseed produced within that province supplemented by imports from Bihar and Central India Bihar consumes local linseed and also imports insignificant quantities from the United Provinces Central India and Rajputana are practically self sufficient and export their surplus

Exports from the United Provinces are directed to Bengal and Bombay and those from Bihar chiefly to Bengal. The Central Provinces export to Bombay and Madras while Central India, Hyderabad and Rajputana States despatch to Bombay. Imports into the presidencies of Bengal, Bombay and Madras are mainly intended for export abroad from the ports of Calcutta, Bombay and Vizagapatam respectively and to a relatively small extent for crushing by mills located at Calcutta and Bombay.

INTER-CHAPTER TWO

Linseed is mainly used, both in India and abroad for the production of oil. In the course of crushing three tons of linseed, under commercial conditions, one ton of oil and two tons of cake are obtained. The Indian production of these products amounts to over 16 million gallons of oil (67,000 tons) and 133,000 tons of cake respectively.

The amount of exports and the quantity of linseed used for internal consumption are roughly about equal but the figures in both cases are extremely variable. The largest single factor in internal consumption is the crushing by mills, and although the oil milling industry has expanded, the amount of linseed crushed shows no consistent trend up or down.

The variable nature of the exports is apparently due to fluctuations in the Argentine crop. Although this is the main determining factor other things have to be taken into account as, for example, the demand from the United States of America where in recent years the local crop has been insufficient to meet their own demand and appreciable quantities have had to be taken from both the Argentine and India. The size of the Argentine crop largely determines the amount of premium obtainable for Indian linseed in, say, the United Kingdom market. The premium is due to the fact that the quality of Indian linseed is higher than that of Argentine for example in so far as it contains 4 per cent more oil on an average. It is also partially due to the fact that the price of Indian linseed is quoted on a clean basis while that of Argentine allows for 4 per cent refraction. Although the premium varies from time to time the price of Indian linseed may normally be expected to be 15 per cent higher than that of Argentine and it is observed that when the premium falls below this point exports from India are stimulated considerably and *vice versa*.

The variable nature of the internal demand is due to various causes but generally to the amount of linseed oil used for the adulteration of other oils, particularly mustard. It appears from enquiries that only one third of the linseed oil produced in India is used for industrial purposes, *e.g.*, in the manufacture of paints, varnishes, etc., and the remaining two thirds for edible purposes. In the Central Provinces and States of Central India, linseed oil is used as such for cooking but in the other areas of Northern India it is almost entirely used as an adulterant of mustard oil, and for this purpose groundnut oil is its main competitor. The pungency of the mustard oil overcomes the comparatively bland characteristics of the others and makes adulteration possible.

When mustard oil is much dearer than linseed oil there is a strong incentive to increase the amount of adulteration but if groundnut oil should be cheaper than linseed oil it will be used instead of the linseed. Although the practice of adulteration is in itself reprehensible it should be recognised that the elasticity which it gives to the internal demand provides a buffer in the event of any sudden contraction in the export trade, and conversely it enables India readily to meet any increased export demand which may arise.

In the absence of an industrial census the figures of mill production are sadly lacking and it is therefore difficult to give precise figures in regard to linseed utilisation in India. It would appear from enquiries however that of the two lakh tons of linseed crushed in this country about two thirds is used in large factory establishments and one third in country *ghanis*.

The cake produced by *ghanis* is generally consumed locally, but two thirds of that produced by the large mills finds its way into the export trade, but the proportion retained for local consumption in some areas is fairly

high For example, in an important linseed producing area like the United Provinces about 60 per cent of the cake produced in the local mills is retained for consumption within the province or in adjacent areas The high figure in this case is probably due to the fact that in recent years several parcels of linseed cake from the United Provinces shipped to the United Kingdom have been rejected on arrival owing to the presence of castor seed husk Exporters, therefore, tend to avoid purchasing linseed cake from the United Provinces except under special terms which are so onerous that many of the mills find it more advantageous to sell their cake locally

So far as can be observed buyers in India or abroad pay little regard to the quality of linseed purchased by them Bold seed is crushed by mills situated in the area where this type of seed is commonly grown and Small seed in the other areas Only one or two mills seem to make any attempt to buy on the basis of quality, and in the export market only buyers of the United States appear to be sufficiently discriminating to appreciate the advantage of buying Bold as compared with Small linseed There seems, therefore, a need for making a clearer commercial distinction between the types

CHAPTER III—WHOLESALE PRICES

A—Indian prices—Official and trade

An analysis of the prices of most agricultural commodities in India is complicated by the general absence of uniform standards of quality and by the fact that official and trade prices are often at complete variance. In the case of linseed the task has been made more difficult owing to the absence of organised trading such as exists in wheat at a large number of markets in the producing areas. As organised trading in linseed under the control of produce associations or exchanges is carried on only at Bombay and Calcutta it has not been possible to obtain for this commodity as reliable or as wide or connected a series of price data as was available for wheat.

The existing system of recording prices by the revenue authorities and their publication as ancient history long after the dates to which they refer has already been discussed in the Report on the Marketing of Wheat. Briefly therefore it may be stated here that the machinery employed in the provinces is more or less the same throughout India. The prices of various commodities at a number of markets are reported to the Tehsildar, a subordinate officer in charge of a tehsil or subdivision of a district by the *hazaar chaudhari*. This is an honorary appointment made by the Collectors or Deputy Commissioners, the incumbent being usually a trader by profession and as such well acquainted with market procedure. The information thus reported is then supposed to be verified by the district officer before being sent to the headquarters of the local government, the departments concerned varying in different provinces. In the Punjab and United Provinces for example the Director of Land Records maintains these data while in Bihar and Bombay it is the Department of Agriculture which is responsible for the consolidation of price statistics.

The official prices of linseed which are published in some of the provincial gazettes fortnightly or monthly as the case may be not only differ frequently and substantially from actual trade records but in certain instances are at variance even with the prices quoted in other government publications. Compare for example the wholesale prices for Lahore as reported in the Indian Trade Journal and the Punjab Government Gazette over the period of one year.

Wholesale prices of Linseed at Lahore

(Per maund)

	Indian Trade Journal (4 per cent refraction)	Punjab Government Gazette (average quality)
	Rs A P	Rs A P
January	6 4 0	4 11 0
February	6 7 6	4 0 0
March	6 4 0	5 0 0
April	6 7 6	5 0 0
May	6 6 6	5 0 0
June	6 3 0	5 0 0
July	5 15 0	4 7 0
August	5 4 0	4 9 0
September	5 5 3	4 7 0
October	5 0 6	4 7 0
November	5 8 9	4 5 0
December	5 15 6	

It will be observed that not only are the trends of the two sets of prices at complete variance but the disparities between them, even after adjusting the difference in the basis of quotation, are so wide as to be quite irreconcilable.

Other instances, perhaps less glaringly divergent, may be seen in the quotations for Raipur and Nagpur (Central Provinces) as recorded by the Municipal Committee and the provincial gazette.

Average wholesale prices of Linseed per maund

1931/1935

	Nagpur		Raipur	
	Gazette	Municipal Committee	Gazette	Municipal Committee
	Rs A P	Rs A P	Rs A P	Rs A P
January	4 7 9	4 5 0	3 7 8	3 3 1
February	4 1 8	4 2 0	3 4 11	3 5 3
March	4 1 5	4 1 10	3 5 0	3 8 0
April	4 2 7	4 3 6	3 4 5	3 5 3
May	4 4 6	4 2 9	3 6 9	3 3 8
June	4 6 11	4 3 5	3 7 11	3 4 1
July	4 6 10	4 4 4	3 8 4	3 5 5 -
August	4 7 3	4 4 7	3 6 2	3 6 5
September	4 5 10	4 5 8	3 6 8	3 6 9
October	4 6 6	4 5 0	3 2 2	3 4 4
November	4 2 3	4 3 10	3 4 7	3 4
December	4 6 5	4 3 4	3 6 9	3 4 11

At Nagpur the maximum difference between the two series of prices in any one month during the five year period 1931/35 occurred in January 1935 and was as much as Re 0 12 0 per maund. At Raipur the widest disparity was also in January 1935 and amounted to Re 0 14-2 per maund. The former represents a difference of over 13 per cent and the latter nearly 20 per cent. Any

number of similar instances could be cited but the few examples quoted indicate the unsatisfactory nature of the present position of price statistics. Evidence was not lacking to confirm the observations made in the Report on the Marketing of Wheat regarding the casual manner in which many officials responsible for the collection and verification of prices undertook these duties and the futility of these data for commercial and marketing purposes. Preference has therefore been given in this report to actual trade prices, wherever obtainable. The prices quoted by the Bombay and Bengal Chambers of Commerce or alternatively those maintained by the Marwadi Chamber of Commerce, Bombay, and the Calcutta Wheat and Seeds Association have been taken as the best index for the prices at the two ports and for comparison of Indian and world values.

B—Comparison of Indian and world prices

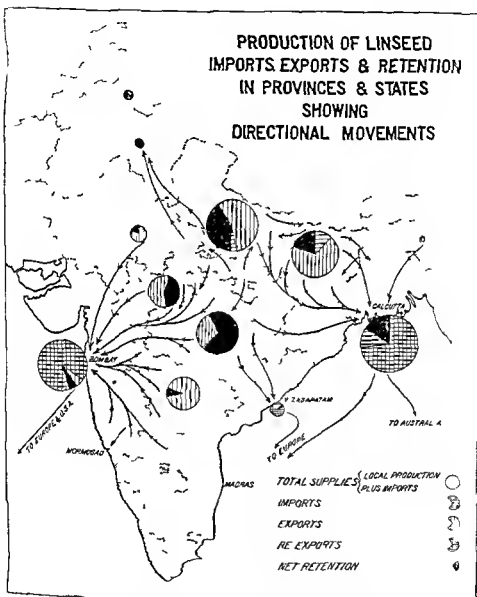
For a comparison of prices in India with those ruling in other world markets it is immaterial whether the Bombay or Calcutta quotations be taken, for both markets, as will be shown in a later section, follow London and usually move closely together. Accordingly, therefore, the Bombay prices have been taken to represent Indian values in the diagram* facing page 67, the other international markets illustrated being Buenos Aires, Duluth (U S A) and London. Although the quotations are in different currencies and based on different units of weight and points of delivery, it will be observed that on the whole, fluctuations show a sympathetic tendency.

A very large proportion of the international trade in linseed and other oilseeds is handled on the Baltic Exchange in London under the terms and conditions of the Incorporated Oil Seed Association contract not only for purchases by United Kingdom buyers but by most consumers of linseed on the Continent and even, on occasions, by United States crushers. The London quotations therefore, represent the nearest approach to a "world price" and as Argentina and India are the two main linseed exporting countries, the London quotations for Plate and Indian linseed may be taken as typical of world values.

The average annual prices for Argentine linseed in London together with the prices at Buenos Aires, Duluth and Bombay, given in the table below, show that in common with all other agricultural products the price of linseed reacted heavily to the world economic troubles which began at the end of 1929. The two bumper crops of Argentine linseed which were harvested during the early depression years, if anything, made the general position worse and the two short crops which immediately succeeded did not improve matters.

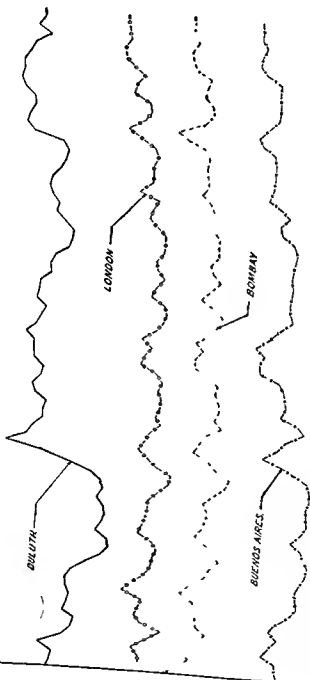
*The price data for this diagram have been obtained from the International Review of Agriculture. The price of linseed at Bombay recorded in this publication is based on the Bombay Chamber of Commerce quotations.

**PRODUCTION OF LINSEED
IMPORTS EXPORTS & RETENTION
IN PROVINCES & STATES
SHOWING
DIRECTIONAL MOVEMENTS**



A B—Re exports refer to exports of linseed out of the supplies imported into Calcutta, Bombay and Vizagapatam from the producing areas

AVERAGE WHOLESALE MONTHLY PRICES OF LINSEED IN DIFFERENT COUNTRIES



*Average annual prices of Linseed in world markets **

	Bombay	London		Buenos Aires	Duluth (U S A)
	Bold	Bombay Bold	Plate	Current quality	No 1 Northern
	Rupees per cwt (spot)	Pounds per ton (c i f)	Pounds per ton (c i f)	Paper pesos per 100 kg. (spot)	Cents per bushel (futures)
	Rs A. P.	£ S D	£ S D		
1929	11 8 0	20 13	18 5 9	18 25	276
1930	10 8 0	17 15 6	15 1 6	17 02	236
1931	6 9 0	11 10 0	8 14 3	10 79	148
1932	6 1	11 9 11	8 8 5	9 22	118
1933	6 0 6	11 5 3	9 11 11	10 57	157
1934	6 7 8	11 17 3	10 0 11	12 77	186
1935	6 10 8	12 5 2	9 12 11	12 31	172
1936	7 6 5	13 12 4	11 6 5	14 37	191
1937	7 14 9	15 5 6	12 16 4	15 47	205

From the high levels of 1929 the price of linseed started falling, fairly gradually at first and then precipitately in 1931 and 1932, touching bottom at Buenos Aires during the latter year with a loss of about 50 per cent as compared with the average annual price ruling in 1929

At Bombay the lowest point registered was a year later in 1933, and in this instance too the loss was roughly of the same dimensions

The greatest fall however was recorded at Duluth where the market declined by some 57 per cent between 1929 and 1932

The London quotations for Indian and Argentine linseed in the United Kingdom also broadly reflected the conditions obtaining in these two producing countries. The net loss between 1929 and 1933 in the case of Bombay Bold was about 45 per cent while Plate seed had already touched its lowest point a year earlier when it had fallen by approximately 54 per cent

With the exception of slight recessions in the quotations for Argentine and United States linseed in 1935 there has been a general upward tendency since 1933 although in the beginning of 1938 prices are still well below the values ruling in 1929 or even 1930. In the early part of February 1938 Calcutta linseed was about £14 17 6 and Plate about £12 12 6 per ton c i f London for near shipment.

Apart from the general relationship between the prices in producing and consuming countries seen from the diagram facing page 67 an examination of the parity between the prices at Bombay or Calcutta and those ruling at London will show that there exists a close degree of sympathy between the two Indian ports and London. Normally a sound or correct selling policy can only be given effect to when Indian prices are on a parity with those simultaneously ruling at London. A number of factors have to be taken into consideration in calculating this parity. The various items reckoned by shippers in India may best be illustrated by converting the Indian price at say Calcutta on any day to its c i f London equivalent and comparing it with the actual price ruling there on the same day. For example the price of small linseed at Calcutta on 17th December 1937 was Rs 5 12-0 per maund and the actual c i f London quotation on that date was £15 1 3 per ton. The following calculation will show how far a parity existed between these two quotations—

	Rs s p	
Price at Calcutta on 17th December 1937 per maund	5	12 0
<i>Add—</i>		
Charges at Calcutta—		
	(Per maund)	
	Rs s p	
Muccadamage @ Rs 0 6-0 per ton	0	0 3
Removal @ Re 0 6 0 per ton	0	0 3
Godown rent @ Re 0 6 0 per ton	0	0 3
River dues @ Re 1 4 0 per ton	0	0 9
Shipping charges @ Re 0 8 0 per ton	0	0 4
Boyer's commission @ Re 1 8 0 per ton	0	0 11
Brokerage @ 6 pies per maund	0	0 6 0 3 3
		<hr/>
Cost f o b Calcutta per maund	5	15 3
per ton	162	0 9
		<hr/>

	£	s	d
Equivalent price in sterling per ton (exchange rate at 1s 6d per rupee)	12	3	1
Add—			
	Shillings per ton		
Insurance @ $\frac{1}{2}$ per cent	1	01	
Superintendence @ 6d per ton	1	00	
Freight Calcutta/London @ 42s 9d (1s 6d less 1%) per cent) per ton	42	70	
Selling brokerage @ 1 per cent	3	04	
Interest @ 5 per cent for 21 days*		87	
Difference between buying basis in Calcutta (5 per cent) and selling basis in London (prime)	12	60	
			3 1 3
Calculated price per ton c i f London	£10	4	4

In this calculation no account has been taken of interest in India. A considerable lapse of time may occur between payment for the goods in India and reimbursement at destination particularly when sales are made for shipment two three or four months ahead. Shippers obtain funds in India by selling to the exchange banks sterling telegraphic transfers or bills drawn at three months sight on London and also borrow money on call † whenever rates are favourable. The rate of interest therefore depends on money market conditions.

Another important factor not taken into account in the above calculation is the gain arising out of the difference between the analysis results found in London and those obtained from the analysis of purchases in India. This is due to careful preparation of the goods for shipment a strictly controlled buying policy and the difference between the London and the local systems of calculating allowances for various impurity determinations. This gain in analysis may be as much as 2 per cent or more according to the season and other conditions and is usually discounted from the c i f price when arriving at the local parity. On the other hand excessive leniency in

*As per clause 3 of the Incorporated Oil Seed Association's Contract the relevant portion of which reads " * * * interest at 5 per cent or at Bank of England rate if over 5 per cent at 10 A.M. on the day of payment to be allowed for unexpired portion of prompt of 21 days from vessel's report ing."

†Call loans—loans subject to recall by the lender on any day provided notice is given before a specified time—usually 1 P.M. Money so recalled must be repaid to the bank the same day. Inter bank call money has been available in recent years at anything between $\frac{1}{2}$ to 1 per cent. While approved merchant houses have usually been able to borrow at $\frac{1}{2}$ to $\frac{1}{4}$ per cent above those rates.

analysing purchases would almost certainly result in a loss under this item

Excluding these two factors from the calculation given in the example quoted the actual price at London on the 17th December 1937, viz., £15 13 per ton, is apparently 3s 1d per ton less than the c i f equivalent of the Calcutta price, based on the above proforma, and to that extent business would have been impossible. The fact that there is (or should be) a gain in analysis, would enable this gap to be bridged and since the figure indicated is in the neighbourhood of 2 per cent, it will be obvious that business between Calcutta and London was practicable on or about the day in question

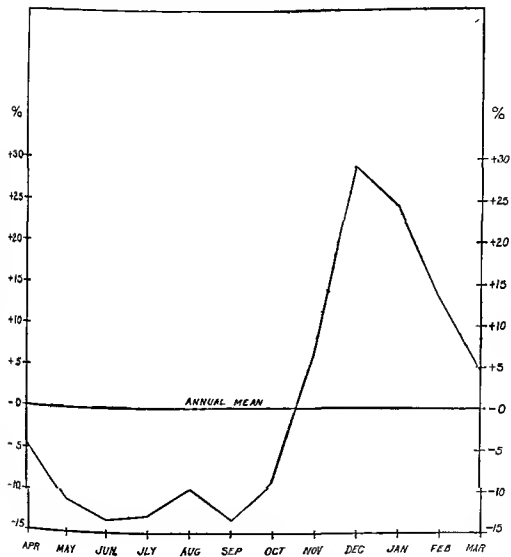
C—Relation between the prices of Indian and Plate linseed in the United Kingdom—effect on exports from India to the United Kingdom

As the United Kingdom is India's most important customer for linseed, it is necessary to examine the relation between the London prices of Indian linseed and those of her competitor, the Argentine, in order to gauge the effect on exports from this country to Great Britain

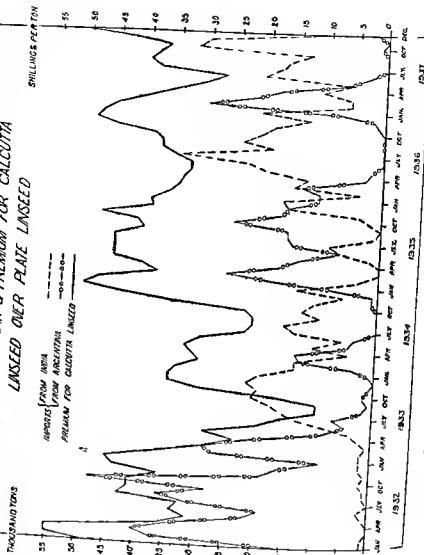
The c i f prices of Calcutta linseed and Plate linseed in London are given in Appendices XVI and XVII and the difference between the two in Appendix XVIII. This difference is, the premium for the Indian product over La Plata is due to the higher oil content of Indian linseed and the difference in the selling basis in London, which is 'pure' for Indian linseed and 4 per cent 'free' for Plate linseed. The highest premium attained by Calcutta linseed over Plate linseed since 1926 occurred in December 1928 and was £4 5 0 per ton and the lowest 3s 9d per ton in September 1929. The premiums fluctuate almost from day to day and as will be shown are largely governed by the relative intrinsic values of the two qualities of linseed, but are mainly influenced by the available supplies in Argentina and India

The seasonal variations in the average monthly premiums for Calcutta linseed over La Plata in London are illustrated in the diagram facing this page. Between April and October the average premium will be found to have ranged from nearly 45 per cent to 135 per cent below the annual mean. This is to a great extent the natural outcome of the pressure of the Indian crop, the season for which commences in March and April and reaches its height during the ensuing three or four months. By October the marketable surplus in India has dwindled considerably while about the same time the prospective new crop of Argentine linseed begins to figure largely as a market factor in consuming centres. The tendency is therefore for the margin between Indian and Argentine values to widen and this actually begins to happen in September, developing rapidly after October and reaching a peak of 29 per cent over the annual mean in December by which time the first supplies of Argentine linseed are already on the market. Thereafter the premium steadily decreases, influenced in its turn by the prospects of the Indian crop

Percentage deviation of the average monthly premiums at London
for Calcutta linseed over Plate from the annual mean



IMPORTS OF LNSEED INTO THE UNITED KINGDOM FROM INDIA & ARGENTINA & PREMIUM FOR CALCUTTA LNSEED OVER PLATE LNSEED



the bulk of which reaches maturity by the end of March. On the whole, therefore, it may be said that the seasonal variations in the price differences in London, between Indian and Argentine linseed are caused by the crop cycles in the two producing countries. It is noteworthy that the bulk of the sales of Indian linseed abroad are normally contracted for between May and September at a time when Indian linseed is standing at a relatively attractive price level as compared with the Argentine product.

The average annual premiums for Indian linseed and the proportion which they bear to La Plata quotations are shown in the following table and illustrated in the diagram facing page 56.

Average annual premiums for Calcutta Linseed over Plate Linseed in London

	Per ton c i f £ s d	Percentage to Plate price		Per ton c i f £ s d	Percentage to Plate price
1926 27	1 16 8	11	1932 33	1 17 6	22
1927 28	1 19 2	12	1933 34	1 4 2	12
1928 29	2 14 10	17	1934 35	1 12 11	16
1929 30	1 13 10	9	1935 36	2 1 5	20
1930 31	2 2 6	16	1936 37	1 19 6	17
1931 32	2 4 9	25	1937 38	1 17 9	15

It is interesting to observe that for the seven pre Ottawa years ending with 1932 33 when the importation of non Empire linseed into the United Kingdom was duty free Calcutta linseed averaged 16 per cent dearer than Plate linseed while in the succeeding five years the relation between the two qualities in London was almost precisely the same in spite of the duty. If the 10 per cent duty on Plate linseed be adjusted against the premiums as also the difference between the selling basis for Indian and Argentine linseed in the United Kingdom it will be obvious why Indian exports to the United Kingdom have been relatively so high since 1933 34 as compared with the Argentine product. For example in 1933 34 the average annual gross margin between Calcutta and Plate linseed c i f London was £1-4 2 per ton. Taking into account the 10 per cent duty (amounting to 19s 9d) and adjusting the 4 per cent difference in the London selling basis (amounting to about 8s) it would appear that Calcutta linseed taking an average of the whole year was actually cheaper than Argentine linseed by 3s 10d per ton in spite of its higher oil content. During this year the landed cost of Calcutta

linseed when it was at its dearest in December 1933 and January 1934 was only 8s 7d per ton higher and when relatively at its cheapest in August and September 1933 as much as £1 0 10 lower than Argentine linseed. The differences over the greater part of the year were such as to favour purchases of Indian linseed and it was not surprising, therefore, to find that imports into the United Kingdom from India rose from an average of a few thousand tons only in 1931-32 and 1932-33 to 174 000 tons in 1933-34.

In 1934-35, the average annual gross premium for Calcutta linseed advanced to £1 12 11 per ton which after adjustments in respect of the import duty and the difference in the selling basis averaged 4s 3d per ton. The relative price levels of Calcutta linseed and La Plata fluctuated considerably in this year, so that while in September 1934 the landed cost of Indian linseed was lower than Plate linseed by £0 8 10 per ton in January 1935 it was higher by as much as £1 2 11. Indian linseed could not therefore continue to find as favourable a parity throughout the year as it did in 1933-34 with the result that imports into the United Kingdom from India declined to 109 000 tons while those from Argentina increased by about 11,000 tons to 78 000 tons. This increase may not appear to be of any special significance but it must be remembered that the total amount of linseed purchased by the United Kingdom in 1934-35 was much smaller than for many years previously or since.

In 1935-36 there was a large Argentine crop which competed strongly against Indian linseed. Consequently the average annual gross premium for Calcutta linseed widened to £2 1 5 per ton equivalent to a net premium of 12s 9d after adjusting duty and the difference in the selling basis. Throughout this year the landed cost of La Plata remained lower than Indian linseed the extreme limits being 3s 5d per ton in March 1936 and 19s 4d in November 1935. As a result imports into the United Kingdom from India fell to 76 000 tons while those from Argentina rose to 180 000 tons being more than double the previous year's shipments.

There was a substantial reduction in the supplies of Argentine linseed during 1936-37 which materially helped Indian linseed to find a larger market in the United Kingdom. The average gross premium for the whole year at which Calcutta linseed stood over La Plata was £1 19 6 per ton but this apparently high figure was equivalent to a net average premium of £0 6 8 per ton only after the necessary adjustments against the current value of linseed which had appreciably advanced since the previous year. The net premium ranged from as little as £0 1 4 per ton in June 1936 to £0 15 3 in December 1936. In consequence imports into the United Kingdom from India rose to 219 000 tons while those from the Argentine declined to 70 000 tons.

In 1937-38 the average annual gross premium which averaged £1 17 9 per ton works out to a net premium of £0 1 1 per ton only. In June 1937, the average landed cost of Indian linseed was as much

as £0 9 7 per ton cheaper than that of Argentine linseed duty paid, while in December 1937, when the margin was at its widest, Calcutta linseed was dearer by £0 15 7. The relationship between the prices of Indian and Argentine linseed in London during this period again favoured purchases of Indian linseed for a greater part of the year, with the result that imports from India into the United Kingdom amounted to 178,000 tons and those from Argentina to 74,000 tons.

The relationship seen to exist between the premiums for Indian linseed over Argentine and the volume of imports into the United Kingdom from these countries is clearly illustrated in the diagram facing page 71. It will be observed that whenever the premium for Indian linseed in London, as typified by the quotations for Calcutta linseed rises, or in other words as the difference widens, this is followed, in most cases, after an appropriate time lag, by a diminution of imports of Indian linseed and an increase of imports of Plate linseed into the United Kingdom. The alternate rise and fall of the curves representing imports from these two countries is very striking indeed.

It will also be clear that the relative intrinsic values of the two qualities of linseed do not control their respective prices. Moreover, a detailed comparison between Argentine and Indian linseed is rendered difficult by a number of opposing factors which in certain circumstances may tend to offset each other in varying degrees.

The quantities of linseed available in India for export are to some extent also linked up with the internal demand for linseed oil. This has already been discussed in Chapter II in which it has been indicated that groundnut oil is one of the chief competitors of linseed oil for adulteration with the higher priced vegetable oils, e.g., mustard oil. When the margin between the price of groundnut oil over linseed oil contracts or when groundnut oil becomes cheaper than linseed oil there is less demand for linseed oil for adulteration.

The volume of the Indian export trade is therefore governed by a combination of two elements. On the one hand are the relative values of Indian and Argentine linseed on the London market, and on the other the internal demand for linseed as reflected by the price margins between linseed and groundnut oils. The interaction of these two factors on the Indian export trade will be gauged from the diagram facing page 76 which shows (a) the monthly variations since April 1931, in the premiums in London for Calcutta linseed over La Plata, (b) the price margins in India between groundnut and linseed oils and (c) exports from this country. While the close affinity between the London premiums for Indian linseed and exports from India is particularly noticeable, the relationship borne by the price margins of groundnut and linseed oils may not appear to be so striking at a first glance. The general trend of the curve however plainly indicates that this factor does have a direct bearing on the export trade.

D—Price differences in respect of quality

Apart from any consideration of market conditions the price of linseed depends on (a) quality and (b) the amount of impurity content (refraction)

(1) QUALITY

As a general rule Bold and Small linseed are not found simultaneously in the same markets in the producing areas. But at the ports and in such other markets as do receive both types of linseed Bold is always quoted at a premium over Small. At Bombay for example it will be found from reference to the following table based on Appendix XIV that the premium for Bombay Bold has ranged from an average of Re 0.17 per maund in 1934-35 to as much as Re 0.50 per maund in 1932-33 representing 2.1 and 7.7 per cent respectively.

Comparison between the average annual prices of Bombay Bold and Small Linseed at Bombay

(Per maund)

	Bold.	Small	Difference	Percentage premium for Bold over Small.
	Rs A P	Rs A P	Rs A P	
1932-33	4 5 10	4 0 10	0 5 0	7.7
1933-34	4 7 7	4 5 7	0 2 0	9
1934-35	4 13 10	4 12 3	0 1 7	2.1
1935	4 15 11	4 14 2	1 9	2.9
1936-37	5 7 10	5 5 7	0 2 3	2.6
1937-38	5 13 9	5 11 5	2 1	2.1

At Calcutta, the differences between Bold and Small linseed based on the annual average prices for the period 1932 33 to 1937 38 are as follows —

Comparison between the average annual prices of Calcutta Bold and Small Linseed at Calcutta

(Per maund)

	Bold	Small	Difference	Percentage premium for Bold over Small
	Rs A P	Rs A P	Rs A P	
1932 33	4 1 2	3 15 5	0 1 9	2 7
1933 34	4 6 3	4 5 8	0 0 7	0 8
1934 35	4 12 6	4 11 8	0 0 10	1 1
1935 36	4 15 3	4 14 1	0 1 2	1 5
1936 37	5 8 10	5 8 1	0 0 9	0 8
1937 38	5 15 2	5 14 6	0 0 8	0 7

In this market Bold linseed i.e., Calcutta Bold has been dearer than Small by between 0 7 and 2 7 per cent in 1937 38 and 1932 33, respectively

It may be mentioned here as has been noted earlier that Bombay Bold and Calcutta Bold represent two entirely different qualities of linseed. The higher premium obtained at Bombay for Bombay Bold over Small as compared to that paid at Calcutta for Calcutta Bold over Small is due to the Bold linseed marketed at Bombay having a relatively greater oil content than Small.

Another significant feature—to which fuller reference is made in Chapter VI—of these price differences is that at Calcutta any linseed which does not conform to the accepted standards for Bold (these vary from 145 to 152) is automatically valued at the price of Small linseed. At Bombay on the contrary a tender which fails to pass the Bombay Bold standard has a value applied to it somewhere between the current quotations for Bold and Small depending on the proportion of small grams found in the lot. This system of determining the price however does not apply to consignments of linseed raised from Satna in Rewa State in Central India. The linseed from this market is designated as Satna quality and generally sold at a flat discount of 6 pies per maund below Bombay Bold.

A tendency for Bold linseed to fetch consistently higher prices than Small was also observed in up country milling centres. At Cawnpore for example the average monthly price differences between these two qualities over 9 months in 1937 as will be seen from the following table varied from Re 0 3 3 per maund in May 1937 to Re 0 4 7 per maund in the following month. Expressed in percentages these differences represent 4 18 and 5 93 per cent respectively.

Comparison between the average monthly prices of Bold and Small Linseed at Cawnpore

(Per maund)

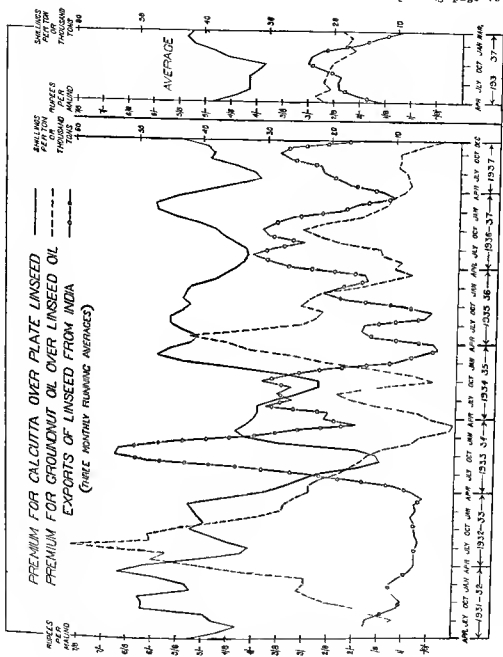
	Bold	Small	Difference	Percentage premium for Bold over Small
	Rs A P	Rs A P	Rs A P	
1937				
April	5 7 0	5 3 6	0 3 6	4 19
May	5 1 0	4 13 9	0 3 3	4 18
June	5 1 7	4 13 0	0 4 7	5 95
July	5 0 2	4 12 5	0 3 9	4 91
August	4 15 0	4 11 6	0 3 6	4 63
September	4 14 0	4 10 3	0 3 9	5 03
October	4 15 7	4 11 7	0 4 0	5 29
November	4 14 0	4 10 0	0 4 0	5 40
December	4 14 0	4 10 0	0 4 0	5 39

In the western districts of the Central Provinces in which a small quantity of white or yellow linseed is marketed these qualities are bought by the local mills at a premium of anything from Re 0 6 0 to Re 0 8 0 per maund over the usual Bold linseed grown in the neighbourhood. The export trade however gives no preference to white or yellow linseed as the quantities involved are generally too small to be shipped separately.

(c) IMPURITY CONTENT OR REFRACTION

In upcountry markets the terms and conditions of sales and purchases are not clearly defined and it is customary for the buyer to examine the produce and make a mental estimation as to the amount

**PREMIUM FOR CALCUTTA OVER PLATE LINSEED
PREMIUM FOR GROUNDNUT OIL OVER LINSEED OIL
EXPORTS OF LINSEED FROM INDIA
(THREE MONTHLY RUNNING AVERAGES)**



AVERAGE MONTHLY WHOLESALE PRICES OF LINSEED PER MAUND
AT BOMBAY & CALCUTTA
(APRIL 1932 TO DECEMBER 1937)

RUPEES
PER
MAUND

6/1
RUPEES
PER
MAUND

5/8

5/8

5/1

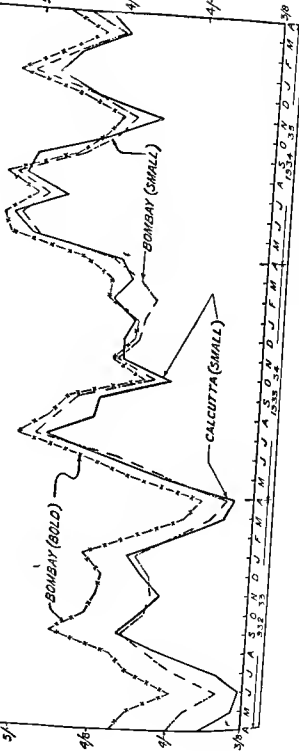
5/1

4/8

4/8

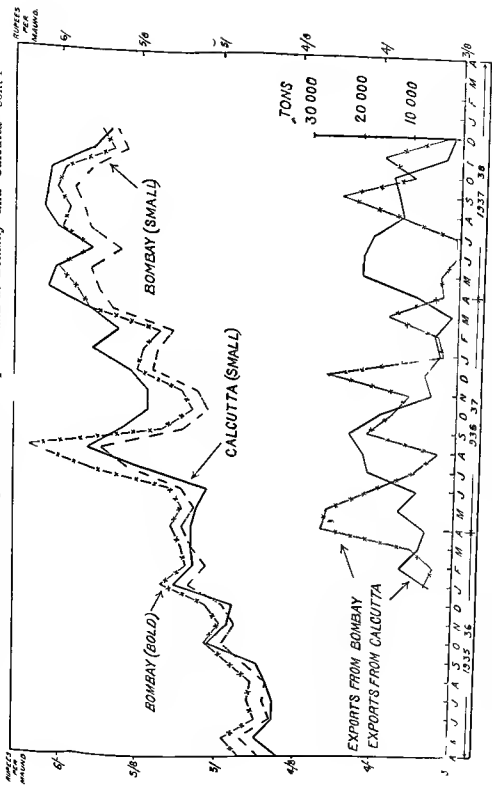
4/1

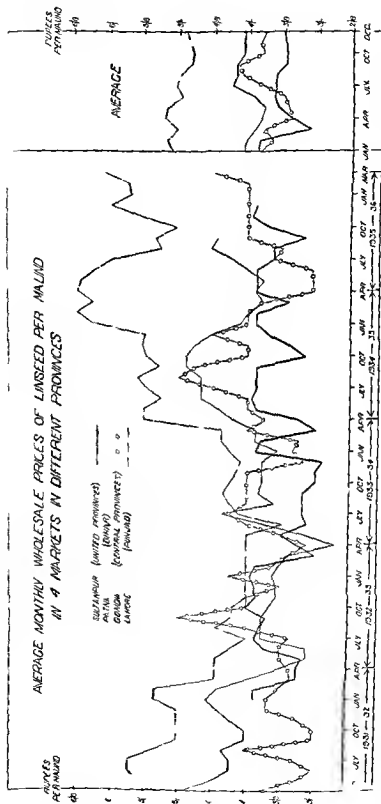
4/1



3/8
A M J J A S O N D J F M A
1932 33 34 35 36 37 38

Average monthly wholesale prices of Linsced per maund at Bombay and Calcutta—cont 1





of impurity content (and other quality factors) before making his offer. Prices therefore, are subject to wide variation on account of the difference in the impurity content of the goods.

It is only in "futures" contracts and in actual delivery contracts made by exporters and mills that the prices of linseed are quoted on any definite basis of impurity content, but this also is by no means uniform. At Bombay the basis for "futures" contracts is 4 per cent mutual while the great bulk of delivery contracts are also made on the same terms* but at Calcutta the basis is 5 per cent non mutual. Accordingly the price of linseed in Bombay is based on a 1 per cent lower impurity content than at Calcutta and is to that extent dearer, quite apart from the difference in the intrinsic values of the Bombay Bold, Calcutta Bold and Small qualities.

Again, the scales of allowances adopted by various buyers make a difference in the evaluation of impurities. For example a lot of linseed which contained, say, 2 per cent damaged grains 3 per cent touched grains and 3 per cent other oilseeds would be penalised to the extent of 3.75 per cent if tendered against a Bombay trade association's contract, 2.75 per cent against a similar contract at Calcutta, 4.5 per cent if delivered to an exporter in Calcutta and 3.6 per cent if accepted by a mill in the United Provinces.

It must be obvious therefore that the prices of linseed not only in the different centres but even in the same market are bound to differ in a degree corresponding to the basis and scales of allowances applied by various classes of buyers.

E—Price variations in the same market

Consignments arriving in the markets always contain varying proportions of impurities. Consequently in practically every up country market where linseed is largely sold after a rough and ready visual examination only, the price paid for different lots in the same market, on the same day, is liable to variations which may sometimes be quite considerable. Arrivals at different seasons of the year also differ as regards their impurity content and other physical characteristics e.g., the proportion of damaged grains etc. so that the prices on different dates and different months of the year even from the same source are of little value for detailed comparison except where full particulars are given as to the amount of refraction carried by each lot.

At the two port markets where organised trading exists and a large volume of trade is done under contracts, the daily variations are on the whole comparatively smaller. The contract terms of various exporting houses have many points of similarity and the prices at which they are able to effect purchases differ to a small extent only. At Calcutta, for example there are often differences up to about Re 0.10 per maund between the prices paid by certain shippers on the same day. Such differences are due not so much to

*A small trade is done in Bazar Dhara or Bazar terms on a 6 per cent mutual basis.

any small variations in the contract terms as to the analysis results of the firms concerned. The firm whose analysis is relatively lenient would naturally be given preference by sellers and would to that extent be able to purchase more cheaply than a buyer whose deductions were known to be higher on account of greater severity in making these determinations.

The prices paid by different mills in the same market are also liable to vary sometimes quite considerably as will be seen from the following table giving the average monthly prices paid in a few months taken at random by two mills at Calcutta. The average monthly quotations ruling at Calcutta, are also given to facilitate comparison.

Average monthly prices paid for Linseed by two mills at Calcutta
(Per mound)

	Mill A	Mill B	Average monthly price of Small linseed at Calcutta *
	Rs A P	Rs A P	Rs A P
April 1932	3 12 3	3 15 0	3 12 10
September 1932	4 6 3	4 5 6	4 5 8
May 1933	4 2 11	3 13 0	4 1 6
October 1933	4 2 9	3 15 0	4 1 5
June 1934	5 3 1	5 3 3	5 2 1
December 1934	4 10 4	4 9 0	4 10 6

Allowing for the effect of changing market conditions during the month—obviously the two mills did not make their purchases on simultaneous occasions—some part of the above disparities may be accounted for by the dissimilarity in the contract terms.

Again the prices paid by certain mills show some variations as compared with the prices recorded by the trade associations. These would appear to be due in some measure to the range of daily fluctuations. In the following table are quoted the actual rates at which a large oil mill in Calcutta bought linseed on certain specific dates taken at random and the prices recorded by the Calcutta Wheat and Seeds Association on the same days.

Prices of Linseed paid by a mill and as recorded by a trading association on certain dates at Calcutta

(Per maund)

Date	Actual prices paid by an oil mill			Prices recorded by the Calcutta Wheat and Seed Association		
	Rs	A	P	Rs	A	P
9th May 1931	4	3	6	4	4	6
5th September 1931	3	12	6	4	1	6
12th March 1932	4	4	6	4	4	6
5th November 1932	4	1	0	4	1	0
3rd December 1932	4	2	6	4	2	0
18th February 1933	4	0	0	3	14	0
10th June 1933	4	8	6	4	12	0
7th October 1933	4	2	0	4	2	3
17th March 1934	4	6	6	4	6	6
14th July 1934	4	12	0	4	12	3
4th August 1934	5	1	0	5	0	0

It was observed that the daily variation in prices is normally within a range of about Re 0 1 0 per maund. Occasionally when very dull conditions prevail prices hardly fluctuate at all. On the other hand during hectic periods of trading which occur at infrequent intervals the market may move Re 0 3 0 or Re 0 4 0 per maund in a day, or even more.

F—Comparison of prices in different markets

The average monthly prices of linseed at Bombay and Calcutta on 4 per cent and 5 per cent basis respectively, given in Appendices XIV and XV are illustrated in the diagrams on the backs of the plates facing pages 76 and 77. It will be seen that the trends show a marked degree of sympathy in both these markets. The price of Bombay Bold, which is always higher than the price of Small at Bombay, is normally at a higher level as compared with Small at Calcutta also. At times however the relative positions are reversed and Calcutta Small—in spite of its intrinsic inferiority—becomes the dearer quality for short periods as for example from April to June 1934. One instance, however, in which Calcutta lin-

seed continued to be relatively dearer for a considerable number of months occurred from September 1936. This was to some extent brought about by a "squeeze" resulting from a shortage of stocks in the Calcutta hinterland and also by the fact that the Calcutta conference rates of freight* were at times lower than those from Bombay. The factors which contributed to the shortage in stocks were (a) large exports from Calcutta, (b) the comparatively lower production in Bengal and Bihar and (c) the larger milling demand at Calcutta, which on occasions exerts a predominating influence on the price level at that port. As larger quantities of linseed oil are used in Bengal, Bihar and the United Provinces for adulteration than in any other province the relative price differences of competing vegetable oils stimulate or restrict the enquiry for linseed oil for this purpose and consequently has a direct bearing on the cost of linseed itself.

All these factors combined to place Bombay linseed on a more competitive footing than Calcutta linseed in foreign markets which resulted in Bombay taking a larger share of the export trade than Calcutta particularly during a large part of 1936-37. It will be seen from the diagram on back of the plate facing page 77 that the widening of the difference is generally followed by a rise in Bombay's exports with a corresponding decline at Calcutta.

The relation which the prices of Bombay Bold, and Small at Bombay and Small linseed at Calcutta have borne to one another during the past 6 years may be seen at a glance in the following table based on Appendices XIV and XV.

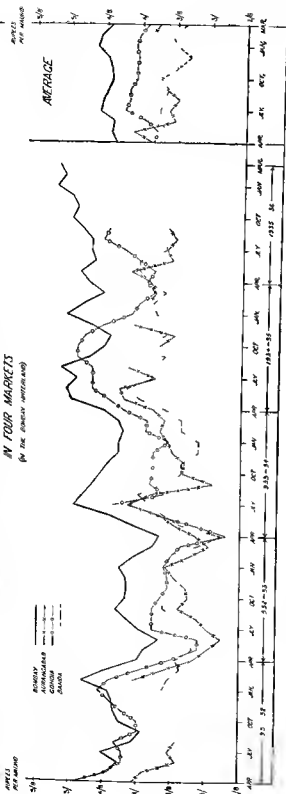
Average annual prices of Linseed at Bombay and Calcutta
(Per maund)

	At Bombay Basis 4% mutual		At Calcutta Basis 5% non mutual
	Bombay Bold	Small	Small
	Rs A P	Rs A P	Rs A P
1932-33	4 5 10	4 0 10	3 15 5
1933-34	4 7 7	4 5 7	4 5 8
1934-35	4 13 10	4 12 3	4 11 8
1935-36	4 15 11	4 14 2	4 14 1
1936-37	5 7 10	5 5 7	5 8 1
1937-38	5 13 9	5 11 8	5 14 6

Apart from the ports there appears to be very little sympathy in the price fluctuations as between up country markets and even at

AVERAGE MONTHLY WHOLESALE PRICES OF LINSEED PER MALIND IN FOUR MARKETS

(IN THE LONDON UNITARIAN)



times between the feeder areas and the ports themselves. For example the diagram facing page 77 shows the movement of prices at 4 markets selected at random in different parts of the country. These are Sultanpur (United Provinces), Patna (Bihar), Gondia (Central Provinces) and Lahore (Punjab). All except Lahore are in the heart of large producing areas while at Patna there is also a milling industry of some importance. It will be observed that there is very little concordance of movement while in some cases prices follow diametrically opposite tendencies. Part at any rate of these divergencies may possibly be due to the questionable reliability of some of the quotations which have had to be adopted for want of other statistics. Nevertheless the variations are sufficiently striking in themselves to make it certain that they are primarily created by lack of co-ordination between the markets.

The diagram facing page 80 shows the relationship between Bombay and the three markets of Banda (United Provinces), Gondia (Central Provinces) and Aurangabad (Hyderabad). With the exception of Gondia where prices show some degree of sympathy with Bombay values the other markets do not appear to respond closely to fluctuations at Bombay, or conversely it may be said that Bombay does not reflect the prices ruling up country as faithfully as might be expected.

Normally prices at origin might be expected to equal the prices at destination, allowing for transportation costs and other incidental expenses but this generally is by no means true of the linseed trade. This is already clearly indicated in the diagram to which reference has just been made and it will also be obvious from the diagram facing this page, which shows the relationship between Calcutta and the prices at three markets—Bihar Sharif and Patna (Bihar) and Sultanpur (United Provinces)—in the areas feeding that port. The price spreads between the assembling markets and the ports are constantly changing and in some markets such as Patna where there is an important milling industry such variations appear sometimes to be very wide. For example, while it normally costs Re 0 12 0 per maund to send linseed from Patna to Calcutta including the value of the bag and all market expenses at Patna the price spread between Patna and Calcutta over an average of 5 years ranged from Re 0 4 6 to Re 0 13 0 per maund. At Banda over a similar period, the price spread varied from Re 0 10 9 to Re 1 2 9 per maund whereas the expenses at Banda and the cost of railing linseed to Bombay are about Re 1 0 6. At Bihar Sharif the price spread ranged from Re 0 10 3 to Re 1 per maund and the cost of delivering linseed in Calcutta Re 0 11 6 per maund.

It will be observed that in many instances an ample margin exists between the port and up-country prices after allowing for all intermediate charges, and it was found that these margins were on the whole greater than in the wheat trade, which by comparison is on a far better organised basis in a number of up-country markets.

G—Seasonal variations.

The position in the major producing areas and at the ports in respect of the monthly deviations from the annual mean wholesale prices is given below and is illustrated in the diagrams facing pages 82 to 84

(1) UNITED PROVINCES

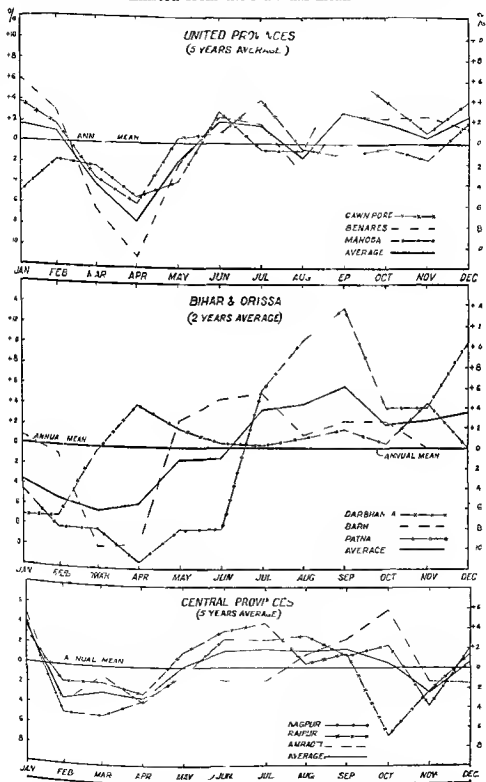
Of the three markets which have been selected as representative of conditions in this province Cawnpore and Benares normally follow Calcutta, and Mahoba, on account of its situation in the south of the province, follows Bombay. From the diagram opposite this page it will be seen that prices have a pronounced downward trend during the harvest months of February, March and April, the low point in all three instances occurring in April. The maximum fall is at Benares and amounts to 11 per cent below the annual mean. At Cawnpore, an important milling centre, where there is usually a fairly constant demand the decline is only about 6 per cent. In May and June the price level rises but falls again in July and August except at Cawnpore where the tendency is for the rise to continue throughout July. Values appreciate in September probably as a result of a certain amount of short covering against sales of September option made earlier in the season at the port terminals of Bombay and Calcutta. The behaviour of the price level at Cawnpore is however somewhat different during August and September, and it would appear that the local milling demand is largely responsible for the comparatively small fluctuations which occur from August onwards and for the fact that the extreme range of variation at Cawnpore is just over 10 per cent—a good deal less than in the other two markets.

Taking the province as a whole the price level is highest in September and lowest in April.

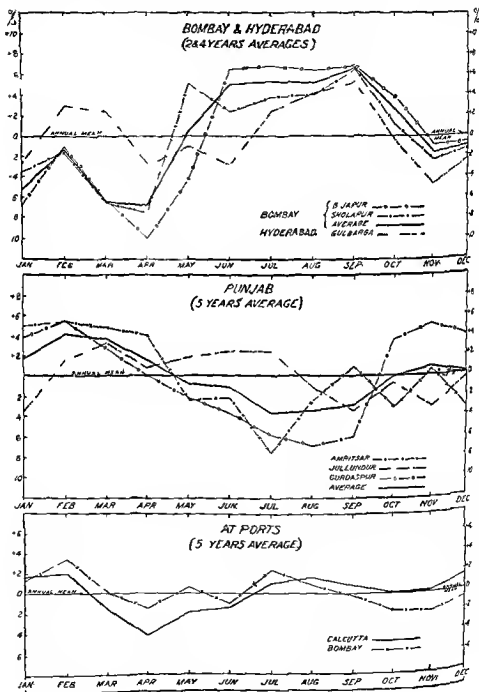
(2) BIHAR AND ORISSA

The seasonal variations in this area are more accentuated than in the United Provinces the extreme range being over 25 per cent and occurring at Patna. As in the adjacent province the usual harvest decline is a prominent feature at two markets—Barh and Patna. At Darbhanga however it will be seen from the diagram that the level rises sharply between February and April. This is difficult to account for and may possibly be due to inaccuracies in the data on which this graph has been based. It will also be observed that there is little sympathy of movement in the seasonal variations shown by the three markets in question. The lowest point touched during the year occurs in January in the case of Darbhanga in March at Barh and in April at Patna. The price level is highest at Patna in September while at Barh this point is reached in July and at Darbhanga during November. An average for the three markets however discloses a more or less similar position as in the United Provinces namely, the low point for the season occurring in March and the high in September.

Percentage deviation of the average monthly wholesale prices of
Linseed from their annual mean



Percentage deviation of the average monthly wholesale prices of
Lunseed from their annual mean



(3) CENTRAL PROVINCES.

The seasonal variations in this province present certain common features with those of the United Provinces and Bihar mainly in respect of the harvest decline and the post-harvest rise. The latter however is not as pronounced as in the areas already referred to. The harvest fall is sharply accentuated between January and February and roughly coincides with the earlier movement of the crop in these parts. Between February and March the average variation is negligible although it is noteworthy that while at Amraoti the level rises by some 3 per cent, it is practically stationary at Raipur and slightly lower at Nagpur. In April prices tend to converge and in all three cases are roughly 3 per cent below the annual mean. Thereafter the level tends to rise but with, however, comparatively little similarity of movement. From April to July, Raipur and Nagpur move together leaving Amraoti to follow a slightly different trend after May. From July to November Raipur takes a course quite at variance with the other two markets and it will be seen that Nagpur and Amraoti are now more in sympathy. The fact that the internal demand for linseed oil for edible purposes is an important and fairly constant factor in the Central Provinces, is probably responsible for the relatively stable seasonal price level. The maximum variation amounts to over 11 per cent and occurs at Raipur between July and October.

(4) BOMBAY AND HYDERABAD

As will be seen from the diagram, the price level, contrary to the tendency in all the other main producing areas rises between January and February. Thereafter the harvest fall is well in evidence at Bijapur and Sholapur in Bombay and Gulharga in the Nizam's Territories, in each case the low point being touched in April. The post harvest rise is also reproduced in these tracts but there is some dissimilarity in the fluctuations of individual markets after May before reaching the peak in September. After September there is a sharp fall the downward trend being arrested in November with a slight recovery thereafter. Bijapur records the maximum range of variation of nearly 17 per cent in the 6 months between April and September.

(5) PUNJAB

In this province the production and consumption of linseed are comparatively insignificant compared with the other areas and the crop matures considerably later. There is little or no industrial demand for linseed nor is there any direct relationship with the port terminals since the local production is too small to figure in the export trade. Discounting the questionable accuracy of the official records it is not surprising to find the seasonal variations very different from those of the other provinces as well as showing considerable irregularity of trend in individual markets. Prices reach their highest in February at Amritsar and Gurdaspur and in March at Jullundur. In the first two markets prices decline more or less continuously until the lowest point of the year is reached in July at

Amritsar and in August at Gurdaspur. At Jullundur the level falls between March and April, rises slowly but steadily through May and June, remains unchanged in July and then declines sharply to its lowest point in September. From August all similarity of movement ends and the level of each market takes its own course. For the province as a whole prices are at their highest in February and lowest in July and August. This is in complete contrast to the other areas of production. The extreme range of variation is nearly 125 per cent and occurs at Gurdaspur.

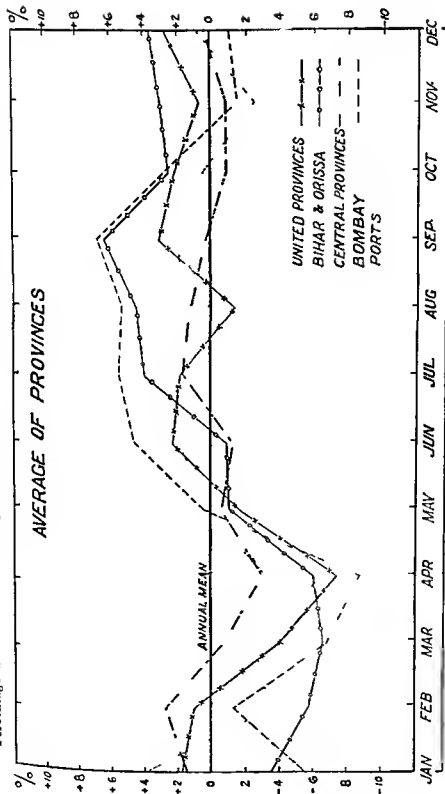
(6) AT THE PORTS—BOMBAY AND CALCUTTA

As might be expected, the seasonal variations at these two terminal markets show considerable sympathy (see diagram opposite page 83). In only two months is there a dissimilar trend of any magnitude, namely, between May and June and July and August. At Bombay the price level tends to drop while at Calcutta it rises. This is largely due, in the first instance to a relatively heavier fall which occurred at Bombay between May and June in 1935 and in the second, to an even greater decline in the same market between July and August 1931. The harvest fall—much the same as in the producing areas—will be observed as also the post harvest rise which reaches its height in July at Bombay and August at Calcutta. Thereafter the tendency is for the level to fall until November when prices harden again. The extreme seasonal range of variation averages 6.25 per cent at Calcutta and only 5.25 per cent at Bombay.

(7) SUMMARY

The seasonal variation from the annual mean in the prices of linseed do not show quite the same concordance of movement as for example is the case with wheat. This is probably largely due to the absence of the stabilising influence of organised trading in up country markets. The only exchanges in which linseed 'futures' can be bought or sold are at Calcutta and Bombay and there are no similar facilities for hedging in the interior. The significant features revealed by the diagrams opposite this page are (a) the deep trough which is formed between February and June with its low point about April (b) the somewhat discordant fluctuations between May and September, mostly tending towards a rise in the latter month (c) the almost general fall from September to November, and (d) the subsequent recovery in December. The pronounced fall between February and April is due to selling pressure arising out of heavy arrivals of new crop. The indebtedness of the cultivator and the necessity to repay earlier borrowing, the collection of land revenue and the lack of adequate storage facilities all tend to weaken the holding power of the grower—and contribute, in varying degrees towards the general harvest depression. During the monsoon months and after May the export demand seems to be largely responsible for the general rising of the price level until September. The movement of the crop up country is also affected by the rains and the deterioration of rural communications to some extent helps to hold supplies off the markets. With the release of stocks which

Percentage deviation of the average monthly wholesale prices of Linseed from their annual mean



Different appliances used for drawing samples.



Parkhi.

Boma.

Scoop.

have been previously hedged against the September option, prices once again tend to weaken and continue downwards until November, after which there is a short recovery until December. In view of the intimate relationship which exists between groundnut and linseed oils for the purpose of adulteration with the dearer vegetable oils such as mustard, it is more than probable that the influence of the new groundnut crop which begins to appear on the market in November contributes to some extent to the weakness in linseed prices after September. Another factor which affects prices after September is the prospects of the Argentine crop. Shipments from that country to Europe and United States, also react on Indian values from December onwards.

The heavy fall in prices—in one instance as much as 25 per cent—during the months immediately following the harvest most seriously affects the grower's return on his produce for it is during this period that the bulk of the crop leaves his hands and comes on to the market. It is also significant that the decline between September and November coincides with the period during which the cultivator disposes of any surplus left over after his sowing requirements for the next crop have been filled. It seems clear that if demand and supply could be brought into closer relationship, particularly during the post harvest months, the heavy seasonal drop would be minimised and the cultivator would obtain more for his produce even after allowing for carrying charges such as storage expenses and interest on advances borrowed on the security of the crop.

The particularly noticeable fall in the price level in Western India as typified by the Bombay and Hyderabad quotations, to which reference has been made would appear to be caused by the small milling demand for linseed which at present exists in those parts. This tendency could probably be largely corrected were markets to be developed for Indian manufactured linseed oil in the countries adjacent to the western seaboard of India e.g., East Africa. It is true that much of the linseed oil manufactured in this country has, in the past been open to criticism on account of inconsistency in quality. But this is not so much the case at the present time for samples of linseed oil produced by reputable manufacturers have on analysis shown excellent results and would appear to be fully equal to the best of the imported brands. In respect of quality therefore the attainment of this object should not be impossible and Indian linseed oil ought to be able to compete on level terms with other brands of imported oils. The question seems worthy of serious consideration by Indian manufacturers.

H—Comparison of "futures" prices

Trading in linseed "futures" takes place only at Calcutta and Bombay under the auspices of five associations* of which two function at Calcutta and three at Bombay. The bulk of such trading is however handled by only two associations—the Calcutta Wheat and Seeds Association and the Marwadi Chamber of Commerce, Bombay.

*A detailed reference to these associations will be found in Chapter IX.

Two delivery months only are traded in, viz, May and September and the dates on which the two positions are opened for trading are fixed by the Committees of the institutions concerned and vary slightly as between Calcutta and Bombay and also in different years. Trading in the September option is opened about the time the linseed crop is ready up country, which is generally about the end of March at Calcutta, and in February, or in some years, even towards the end of January in Bombay. Trading in the May option begins in June of the previous year. It will be observed therefore that trading in the September option is open for about 6 months of the year while that for May for about 11 months.

The September futures' quotations as will be shown later are based largely on the costs of storage and are concerned mainly with the crop immediately available. Being closely related to ready values the September option is also influenced by world conditions in general by weather conditions in India, by the final estimate of the Indian linseed crop published early in June as well as by the news received from time to time concerning the Argentine crop sowings between June and August. The May option which reflects the anticipated prices for the next Indian crop is governed by somewhat different factors. As trading starts before the crop in question has even been sown greater speculative tendencies are involved. World values not only for linseed but also for other oilseeds and vegetable oils contribute largely in determining whether the price level for the distant positions are to be higher or lower than that ruling for the current crop. International elements of which the chief factors are (a) the supplies available from Argentina and (b) the demand in Europe and the United States exercise a predominating influence in determining the course of May option prices in India particularly during the earlier months of its currency. It is only many months after the opening of trading in this option that the prospects of the Indian crop and the forecasts published in January and March assert any influence on this position.

The monthly average of the weekly closing "futures" prices for the May and September options together with the corresponding ready prices at Calcutta and Bombay are illustrated in the diagrams facing pages 88 and 89. It will be seen that on the whole "futures" prices are in close sympathy with ready prices. "Futures" prices being generally higher than the ready values have a stabilising effect on the price level in general and thus appear to be advantageous. This is particularly marked in the relationship between ready and September values during the currency of this option.

The number of occasions in different years, on which the weekly closing "futures" prices were at a premium or discount as compared to ready or spot values at Calcutta and Bombay are shown in Appendices XIX and XX. It will be observed that at Bombay during the last seven seasons the May option was higher than the ready quotations on 272 occasions and lower on 59 whereas the September option prices were higher on 220 occasions and lower on

5 only During the same period at Calcutta the May option was higher than ready prices on 184 occasions and lower on 115 while September was dearer 164 times and cheaper 10 times Thus it will be seen that while the September "futures" was lower than spot values on a very few occasions only, the May option was lower once in six times at Bombay and more than double that proportion at Calcutta

It is not easy to account for the different market view taken by Calcutta operators which is responsible for the greater number of occasions on which the May "futures" is at a discount below ready at Calcutta as compared with Bombay It is true that the linseed crops in the areas feeding Calcutta and Bombay are not subject to the same seasonal influence and that the retention of linseed in the Calcutta hinterland is liable to greater variation than in Central and Western India This is due to the close relationship existing in the former areas between linseed and other oilseeds arising out of the interchangeability of their oils for edible purposes These factors in themselves however could hardly account to the full for the bearish tendency in the May futures at Calcutta It seems only reasonable to conclude that the speculative element is somewhat more in evidence at Calcutta than at Bombay and plays a relatively larger part in bringing about these conditions

It would appear therefore that the opening of trading in the May option long before the crop is even sown in India or any definite intelligence is available in respect of the forthcoming Argentine production serves no useful purpose in regard to the prices of the current season's crop in India Trading in the May position during the early months is therefore much more of a speculative counter than a stabilising influence Its effect might be avoided or at least partially eliminated were trading in May to be opened later This is a matter for consideration by the trade

Another form of "futures" transactions the object of which is almost entirely speculative and in which there is no intention whatever of giving and receiving delivery is what is known as *Teji Mandi** or "put" and "call" options This type of transaction is prevalent in a number of markets for commodities in which "futures" trading is conducted and may be carried on either under the auspices of an organised association or conducted as between brokers and their clients outside the jurisdiction of the association While it is true that these "put" and "call" options are indulged in by large concerns for the legitimate purposes of trade, there is ample evidence to point to the fact that a considerable proportion of the volume of *Teji Mandi* transactions is undertaken by a vast body of ill informed amateur speculators many of whom are not even directly concerned with the commodity in which they are operating

When a *Teji* option has been bought should the prices on the delivery date exceed the price ruling at the time the contract was

**Teji*—lit dearness i.e. a "bull" option or option to buy
Mandi—lit cheapness i.e. "bear" option or option to sell
Teji Mandi—a double option, i.e. to buy or sell

made, plus the premium, the buyer exercises his option to buy at the contract price and makes a profit equal to the difference between the price ruling on the delivery date and the contract rate plus the premium. If on the contrary prices fall the speculator's loss is limited to the amount of the premium which he has paid as he naturally would not exercise his option to buy. Conversely when a fall in prices is anticipated a *Mandi* transaction is made. Again, if it is considered that values are likely to fluctuate heavily and the trend is uncertain a *Tep Mandi* or double option contract is effected in which the payment of a double premium entitles the operator to buy or sell as conditions may warrant on the delivery date.

I—Market Intelligence

It has been mentioned earlier that a regular and reliable series of price records are available only for Calcutta and Bombay where the daily opening and closing rates both for ready and forward positions are posted up in the trading rings of some of the trade associations. These and the intermediate fluctuations are constantly being telephoned by brokers to their various clients or employers or conveyed by personal calls. The latter in their turn telegraph telephone or communicate by post with their branches or constituents in other markets. The larger commission agents in the up-country markets who have connections at the ports keep their correspondents in the smaller assembling centres posted with market news mainly by postcard and letter and occasionally by telegram if the occasion warrants. From this point however the dissemination of market information rapidly deteriorates and the written word is replaced by verbal communication only.

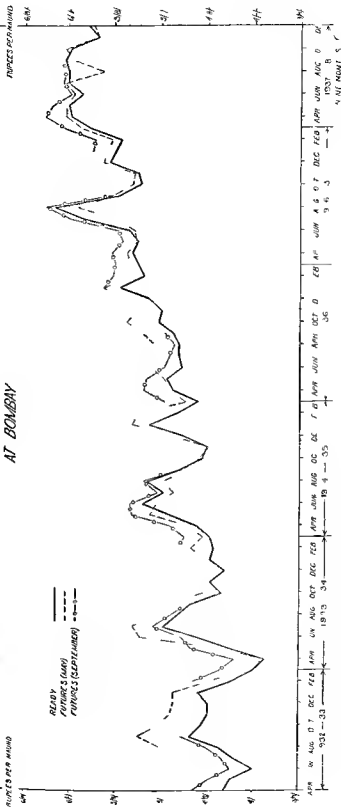
Normally the cultivator gets his market news from such neighbours as may have lately visited a market or from the village merchant or a passing itinerant trader. It must be obvious therefore that such market intelligence as eventually filters through to the producer is not only out of date but in most cases inaccurate. Further it is not always intelligible because of the diversity of customary allowances, units of quotation and weights and measures. The discordant trends in the prices of linseed in the different markets and the wide price spreads which so frequently exist between the prices obtained by the producer and those paid by the consumer go to indicate that market intelligence leaves much to be desired. If the producer is to get better prices for the fruits of his labour it is of the utmost importance that he should receive more adequate quicker and more intelligible information in this respect.

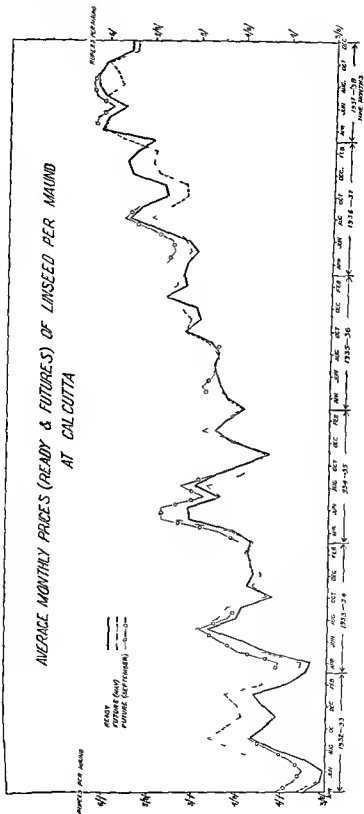
The channels through which market intelligence is conveyed to the general public may be summarised as follows —

(1) DAILY NEWSPAPERS

The daily London quotations for Indian and Argentine linseed as well as the prices ruling at Indian ports together with general remarks on market trends are included in the commercial columns of some of the more important English 'dailies'. Prices for a few other

AVERAGE MONTHLY PRICES (READY & FUTURES) OF LINSEED PER MAUND AT BOMBAY





markets, for example, Delhi, Cawnpore, Indore, etc., are also quoted in some of the local papers published both in English and in the vernaculars

In addition to price data the daily press also publishes abstracts from the official forecasts of various Indian staples. The forecasts are issued at specific intervals by the Director General of Commercial Intelligence and Statistics, Calcutta, and are based on primary material furnished by the provincial authorities—in most cases the revenue and agricultural departments. From time to time information obtained from international news agencies, such as Reuters are published concerning the linseed crops in the Argentine and the United States and the world position.

(2) TRADE PRESS

Quotations and short market reports regarding the prices at the ports are also published in the trade press, typical examples of which are the weeklies, 'Capital' and 'Commerce'. Such reports are obtained from reliable correspondents who are usually merchants or brokers actually trading in the commodities discussed. In addition to the trade press, institutions such as the Bengal and Bombay Chambers of Commerce, publish weekly reports for circulation to members, various government departments and in certain cases to private subscribers. These reports include price quotations for a number of commodities, rates of sea freight, the prices of government securities, exchange rates for demand drafts and telegraphic transfers and all matters of general commercial interest. They also furnish details of inward and outward traffic. Private agencies and firms also issue periodical market reports and quotations. In some cases these are compiled expressly for sale and in others they are issued free of charge to clients. For example, a certain concern in Calcutta specialises in the compilation for sale to subscribers of import and export statistics relating to the several commodities handled at that port. As the information is expeditiously available and conveniently drawn up in a consolidated printed sheet giving the names of shippers and the extent of each individual firm's shipments with destinations, the commercial community particularly exporters find it useful to subscribe to a service of this nature rather than wait for two or three months for the emergence of the official publications concerned, or in the alternative, maintain special staff at the Customs House.

(3) GOVERNMENT PUBLICATIONS

Possibly the most important of these from the practical viewpoint, and the one which usually reaches the general public sooner than any other official publication is the *Indian Trade Journal*, published weekly, by the Director General of Commercial Intelligence and Statistics at Calcutta. This journal quotes the Calcutta and Bombay markets and also receipts at and exports from Calcutta, Bombay and Vizagapatam. Price quotations are obtained from the Chambers of Commerce, and trade movements from railways and the customs department. Comparatively recently a new feature has been instituted in which a brief market report on linseed is given together with quotations for Argentinian

tine linseed and linseed oil at London. Data for this are obtained from a weekly cable from the High Commissioner for India. London addressed to the Agricultural Marketing Adviser and distributed from his office. An estimation of stocks at Bombay, Calcutta and up country markets is also given based on trade reports while stocks of linseed in Hyderabad State are specially communicated by the State authorities.

Three all India forecasts concerning the linseed crop are issued annually from the office of the Director General of Commercial Intelligence and Statistics at Calcutta. These are published in the Indian Trade Journal immediately after issue. The first forecast appears about 1st January, the second about 15th March and the final one about 1st June.

The Imperial Council of Agricultural Research issues a weekly circular based partly on information supplied by the Director General of Commercial Intelligence and Statistics and including information received from a special correspondent in Argentina and a specially cabled report on market conditions in London. The circular contains, in concise form, statistics relating to the prices and trade movements of linseed and linseed oil as well as a report on market conditions at Calcutta, Bombay and London.

Since October 1936 a weekly market report dealing with wheat, linseed and rice is broadcast from Delhi every Sunday evening both in English and in the vernacular. This report is furnished by the office of the Agricultural Marketing Adviser and is based on data supplied by Chambers of Commerce and other trade associations at a number of important centres and represents the latest available information up to the close of trading on Saturday. The contents of the weekly cable from the High Commissioner for India, London, which is received on Saturdays by the Agricultural Marketing Adviser are also included in this weekly broadcast report. The text of this cable is subsequently passed on to the Imperial Council of Agricultural Research for the weekly circular previously referred to and to the Director General of Commercial Intelligence and Statistics at Calcutta for incorporation in the next issue of the Indian Trade Journal.

The provincial gazettes of a number of provinces also publish the prices of linseed for certain markets fortnightly or monthly. These data might be of some academical interest were the quotations reliable but this does not appear to be so in the majority of instances. It has already been shown that the official price quotations are often at complete variance with trade records and are accordingly of little value as a contemporary record.

(4) POST TELEGRAPH AND TELEPHONES

When *arhatiyas* or commission agents use the post the most popular medium of communication on account of its cheapness is the post card. A number of these firms have printed post cards giving the names of the various commodities with appropriate blank spaces

for the filling in of quotations. These are entered up from time to time and posted to their correspondents. It is common to include from time to time general observations on the tone of the market. Telegrams are used when quick transmission of news is desired as for example when asking for or giving instructions to buy or sell. The use of the telephone has greatly increased in recent years and the number of trunk extensions which have lately been put into operation testifies to the growing popularity of this medium of communication.

Codes private or otherwise are not in general use by indigenous concerns but are indispensable to shippers with foreign connections and are in constant daily use.

(5) RADIO

The use of this comparatively new medium for the dissemination of market intelligence is of very recent origin in India. Originally receiving sets were bought for recreation and amusement but its potentialities having been realised an increasingly large section of the trade is now finding it profitable to listen in to the various commercial reports which are now being broadcast from Calcutta, Bombay and Delhi.

At present market information percolates slowly to the rural areas. Attempts are therefore being made to provide villages with receiving sets and to cater for the needs of the cultivator as part of rural development programmes. The recent installation of new short wave transmitting apparatus at Delhi, Bombay and Calcutta will doubtless enable these benefits to be enjoyed over a far wider area than was hitherto possible with the original medium wave equipment and there is reason to anticipate that in due course the facilities now offered will be availed of to an increasing extent.

The weekly report on wheat, linseed and rice which is being broadcast from the Delhi station every Sunday has already been referred to. A daily service in respect of ready and futures prices of wheat and other food grains at Hapur has also been running for several months. The closing rates at Hapur, an important market in the west of the United Provinces, are telephoned every evening to the office of the Agricultural Marketing Adviser whence they are forwarded to All India Radio for inclusion in the same evening's rural programme.

(6) GENERAL

From what has already been said it will be obvious that prices are not strictly comparable under present conditions. For example at Bombay linseed is quoted on the basis of the hundred weight (112 lb) while at Calcutta quotations are per maund of 80 2/7 lb. In the latter market the local contract terms are non-mutual and permit a free tolerance of foreign matter to the extent of 5 per cent. The Bombay contract on the other hand is mutual the basis being 4 per cent. Again price quotations at Calcutta and Bombay are inclusive of new bags whereas those in up-country markets do not include the bags. It is essential therefore that for

a proper comparison of prices the basis for quotations should be the same. Negotiations between the Central Marketing Staff and the trade as regards the adoption of an all India standard contract for linseed have reached an advanced stage, and the proposed terms have already received the approval of representatives of the interests concerned (see Chapter VI)

A suitable system for the maintenance of up to date price statistics has been very roughly outlined in the Report on the Marketing of Wheat. The proposal made was that the provincial marketing staff should be made responsible for collecting and verifying the accuracy of prices at local markets and for seeing that the rates particularly the closing ones, are posted up so that the cultivators could see how the market closed the previous day. The central office would be the focal point for reports sent in by telegram and letter for one or two of the largest markets in each province and from the local headquarters of the provincial marketing staff if this happened to be located in an important commercial centre, and would arrange to issue periodical bulletins to be broadcast.

It is most desirable that the fullest use be made of the existing marketing organisation which is in the best possible position to remedy the deficiencies which at present exist in regard to the maintenance and dissemination of trustworthy market information. There should also be closer co ordination between rural development work and the facilities which are now available to ensure the provision of really up to date accurate and reliable price data and their rapid and widespread transmission to the producer.

INTER-CHAPTER THREE

The quotations given for certain markets in the local government gazettes differ from those quoted for the same market in Government of India publications, and in the same province the figures given in the Government Gazette differ from those published by the Municipality by as much as 20 per cent or Re 0 14 0 per maund. Such quotations are of no value in marketing.

The figures put out by the trade associations are much more reliable. It is unfortunate however that so far as linseed is concerned there are only two centres for which a reliable series of prices is available namely, in Bombay and Calcutta where the Chambers of Commerce publish regular prices based on the reports obtained directly from the trade. A random check showed that the actual buying prices of a Calcutta mill over a series of years varied from the figures of the trade association by Re 0 1 0 per maund more or less, which compares favourably with the difference found to exist between Municipal and Government gazette figures as already referred to.

The trade prices at Bombay may be taken as referring to Bold seed and those at Calcutta to Small, and the price series in each case may be taken as a useful basis for the study of Indian prices and for comparison with prices abroad. In general Indian prices follow the course of prices for linseed in other important international markets, *e.g.*, Buenos Aires, Duluth (U S A) and London. As the United Kingdom is the largest buyer of both Indian and Plate linseed the prices on the London market may be taken as typical of world prices. There, Indian linseed is fairly regularly quoted at a premium over Argentine which in some years has averaged as low as 9 per cent and in others as much as 25 per cent. It is observed that shipments from India react very closely to the amount of the premium. When the premium is low, exports are high and *vice versa*.

Apart from the higher oil content of Indian linseed and the fact that its price is quoted on a clean basis, whereas 4 per cent refraction is allowed in Argentine linseed, several other conflicting circumstances affect the amount of the premium obtainable, and in making a comparison of the prices of Indian and Argentine linseed in London all the factors must be taken into account. Certain crushers of high grade oils, for example, regularly pay a premium on Indian linseed but this may be offset at times by pressure to sell on the part of India and also by the somewhat variable efforts of the Argentine to peg prices. The operation of the Ottawa preference should tend to maintain the premium on Indian linseed at a figure commensurate with the difference in intrinsic value, but this is offset to some extent by the effect of the drawback granted on linseed oil exported from the United Kingdom. The rate of the drawback has been modified from time to time in view of the current values of linseed, being, for example 30 sh in 1933 and 60 sh from November 1934.

So far as quality is concerned Bold seed generally commands a premium over Small at the port markets, though they are seldom however found quoted separately, in upcountry markets. The premium on Bold over Small is only about $2\frac{1}{2}$ per cent in Bombay and about half that amount in Calcutta. This does not appear to be adequate in view of the much higher oil content of the Bold seed and the position becomes still more anomalous when, as sometimes happens, Bombay Bold is sold at a price lower than Calcutta Small. The disadvantageous selling price of Bold seed in Bombay may be accounted for by the fact that in Calcutta and in the regions serving Calcutta, the milling of linseed is an industry of some importance and tends to give stability by lessening the dependence of prices on the export trade. This factor also exercises a stabilising effect on the seasonal fluctuation

in prices For example, in the Central Provinces where a steady local demand for linseed oil for edible purposes is met by a large number of small *ghanis* the maximum variation in the course of the season is only about 11 per cent, and in the United Provinces at Cawnpore where there is an important milling industry, the seasonal variation is just over 10 per cent, but in Bihar and Orissa where the local crushing industry is relatively unimportant, the rise in prices from harvest time—April to September—amounts to 25 per cent, and in Bijapur in Bombay in the course of six months between April and September, the price increases by about 17 per cent

Where a producing district is dependent on the export market only, there is, as a rule, a tendency for the seasonal harvest depression to be greater than in those areas where the local milling industry exists In the interests of growers in those areas, therefore, there seems a need for establishing some system of organised marketing to prevent supplies being rushed on the market, or alternatively for the development of a local crushing industry

Comparison of prices in different markets is somewhat difficult under present conditions For example the amount of refraction allowed in Bombay is 4 per cent (mutual) and in Calcutta 5 per cent (non mutual). Quotations are made on the basis of the hundredweight (112 lb) in Bombay, while in Calcutta quotations are per maund of 82 2½ lb Further, the prices quoted at Calcutta and Bombay include new bags but those in up country markets do not include the bags While price movements at port markets are closely related those in inland upcountry markets are widely divergent and appear in some cases to bear no relation to the price at the port and to move in contrary directions as compared with corresponding neighbouring markets This indicates the necessity for improving the present system of

disseminating market news and for this purpose a more extensive use of the radio is indicated. Some development in this direction has already been put in hand by the Central Marketing Staff, but similar action is called for in all the provinces and major States.

The bearing of "futures" on "ready" prices is often thought to be harmful. In the case of wheat there are a number of fairly representative associations trading in "futures" in upcountry markets, but in the case of linseed Bombay and Calcutta are the only important centres for dealing in "futures". Only two delivery months are traded in, namely, May and September, and the period during which these contracts are open varies from year to year. Generally the September option is open for about six months and that for May about eleven months. It seems clear that the September "futures" quotations are largely based on the cost of storage and are normally therefore higher than the "ready" prices. So far as can be calculated this "future" shows a profit on storage but the May option is influenced more by the Argentine crop and the prospects of the next Indian crop rather than by the costs of storage and appears to show a loss. Although as a whole "futures" prices are in close sympathy with "ready" prices, and being higher have a stabilising effect, it may be observed that during the course of seven seasons the May option was lower than "ready" on 59 occasions out of 331 at Bombay and the September option lower on 5 occasions only out of 225. During the same period the May option at Calcutta was lower than the "ready" 115 times out of 299 occasions while the September was higher 164 times out of 174.

It seems only reasonable to conclude from those figures that the speculative element is somewhat more in evidence at Calcutta than in Bombay and tends to bring about a bearish tendency in the May "futures". It

would appear that the stabilising effect on the " futures " market of linseed prices in India could be improved by putting the September contract back to say October or November and by reducing the period during which the May option is open. There might, however, be some danger in converting the September into a November contract since from November onwards the linseed market is likely to be influenced not only by the arrivals of Plate linseed on the world markets but also by the early arrivals of the large groundnut crop in India itself. At all events, some reform of the present system of " futures " contracts appears to be a matter requiring examination by the interests concerned.

CHAPTER IV—PREPARATION FOR MARKET

A—Harvesting threshing and winnowing

Linseed is grown in India primarily for its oil and not for the fibre (flax). After harvesting the crop is threshed and the seeds separated by winnowing. The various methods adopted have a definite bearing on the quantity of impurities present in the linseed.

(1) HARVESTING

The crop is harvested from the middle of February to the end of April depending on the weather conditions of the different producing areas. Harvesting commences about the middle of March in the United Provinces and is finished by the middle or end of April. In Bihar Orissa and Bengal operations start about a fortnight earlier and finish at the same time as in the United Provinces. The crop in the Central Provinces Bombay Presidency and Hyderabad matures earlier so that harvesting is taken in hand early in February and is over a fortnight or a month in advance of other areas. On account of climatic conditions harvesting in Kashmir is not done until about July. Generally speaking hold linseed is harvested earlier than small¹.

As has been stated the crop is also sown as a mixture with other crops such as wheat gram rape and mustard. The actual method of harvesting all these crops is similar throughout the chief producing areas. As a rule the plant is first cut close to the ground with a sickle, but it is sometimes up rooted in which case the earth sticking to the roots gives rise to a greater quantity of impurities with linseed. The type of sickle used may either have a serrated or a plain cutting edge.

(2) THRESHING

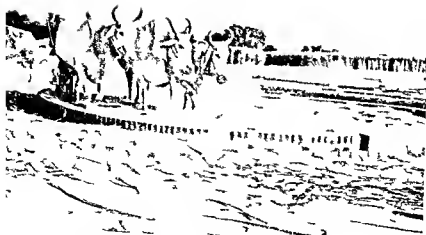
Before threshing the plants are allowed to dry from two days to a week. The threshing floor is usually any open flat space either in the fields or near the homestead. It is first swept and then plastered over with a mixture of cowdung and earth*. In some places as in the Bombay Presidency all the threshing floors of a village are located in one place and all types of produce are conveyed to this common spot for threshing. The actual operation is as follows. The dried plants are spread out on the floor and trodden under the feet of bullocks the animals being driven round and round over the plants which are being continually raked and turned over. The process is depicted in the illustrations opposite this page. The *phalla* (beam) system is also made use of occasionally as in the case of wheat. Where the quantity for threshing is small the plants are beaten with sticks or small wooden mallets (*moongries*) in order to separate the seeds and chaff from the straw.

The method of treading out linseed by bullocks is defective in more than one way. Apart from droppings the hooves of the

*An improved threshing floor will also be seen in the lower illustration opposite this page.



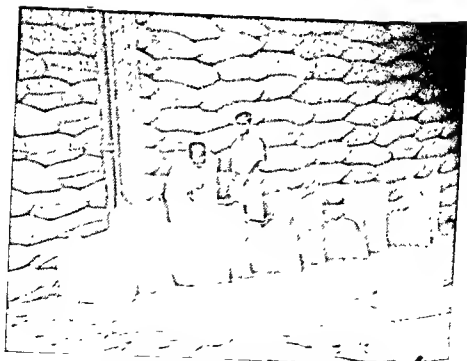
Threshing linseed



An improved threshing floor
(Note the raised brick edged platform)



Winnowing Linseed.



The Bombay method of drawing samples.
(Note the arrangement of the bags.)

bullocks carry impurities and also cause the surface of the threshing floor to break up and get mixed with the produce. Secondly the fibre, with the straw, is destroyed. Above all it appears to be an unnecessary waste of energy to break up the stalks and stems of the plants, because the crushed straw has no particular value as a cattle food or otherwise.

Mechanical or improved methods of threshing are not used except in the Madras Presidency where it is reported that stone rollers are at times used for threshing. The production of linseed in Madras is of course insignificant.

The utilisation of any other part of the plant is likely to be beneficial to the cultivator of linseed and the problem needs investigation. At present the straw is used as fuel only, but during the course of this survey, there appeared to be some indications of a market for linseed straw if it were to be collected and handled suitably*. It would seem that whatever value the grower could get for the straw would help to reduce the cost of production and ultimately place Indian linseed on a more competitive footing in the world market.

(3) WINNOWERING

Winnowing separates the seed from the chaff. Here too the methods adopted are common in all the provinces not only for linseed but also for the other grain and oilseed crops. The mixture of seed and chaff is allowed to fall out of a basket from a height and the winds of heaven do the rest. (See plate facing this page.) As the seeds and chaff fall from the basket, a helper, squatting at the winnower's feet, removes the heavier pieces of husk and chaff which the wind fails to carry away, with a broom.

In the case of the mixed crop, a preliminary separation of grains is necessary. For instance, in a mixture of gram and linseed the gram being the heavier grain falls near the winnower's feet while the linseed is carried a little further away by the wind. It is then run through sieves made of bamboo slats or perforated tin sheets. The linseed passes through the sieve leaving the gram uppermost although a certain quantity of the smaller or shrivelled and immature grains of gram may also pass through the sieve along with linseed. Sometimes this operation takes place at the commission agent's shop in which event the sieves are hired out at the rate of about 3 pies per bag of grain or oilseed sieved but in many instances the mixtures are carried to the markets without further treatment. This is quite common for example in the Jalau district (United Provinces) where carts containing mixtures of linseed and wheat or gram known as *gazar* arrive in large numbers at Konch and Oran markets. As will be explained in a later chapter, sufficient cleaning of the mixed produce is not undertaken because the cultivators believe that it does not pay to put a cleaner article on

*Mr J. A. H. Duke lately the Oil Expert to the Government of the United Provinces, has recommended a method for the preservation and recovery of the straw fibre.

the market The practice of making deductions for refraction even if the goods are clean, must to some extent be held responsible for the impurities in the produce

(4) Costs

The harvesting threshing and winnowing of the linseed crop is done almost wholly by the cultivator himself, aided by his family Only occasionally is hired labour employed When this is resorted to, the labourers may be either male or female or both As linseed is a *rabi* crop and the time of harvesting coincides with that of wheat hired labour is comparatively expensive It is generally paid for in kind in the United Provinces, Bihar and Orissa the average rate of remuneration being 5 to 8 per cent of the produce cut In the Gorakhpur and Bundelkhand Divisions of the United Provinces, the harvesting charges when paid in cash amount to about 2 annas per head per day while in the Central Provinces the wages per head per day vary from 1 anna to 2 annas 6 pies The daily wages are often supplemented by a midday meal When paid in kind any kind of gram of the equivalent value may be given at the convenience of the employer

B—Practice in other countries

No comparison with the methods in vogue in the other countries can usefully be made owing to the wide difference in conditions costs of labour means of communication and size of holdings The methods adopted in India are primitive while in the Argentine and the United States these operations are carried out on large holdings by combined harvester and thresher machines drawn by mechanical tractors in most instances

INTER CHAPTER FOUR.

Since linseed is not grown for its fibre, the first stage in the preparation for market consists of threshing out the seed. As in the case of wheat, the crop is cut by hand and in some cases simply uprooted. This latter practice is definitely bad from the point of view of cleanliness. Threshing by treading out the grains by bullocks also adds to the impurities. Winnowing is perhaps the most important stage in the preparation. Apart from the common practice of shedding the seed from a height and allowing the wind to carry away the straw and dust, the linseed is frequently passed through sieves but even so other grains pass through at the same time. Winnowing operations are generally unsatisfactory particularly in those extensive areas where mixed sowing is the prevalent custom.

The cultivator is however not encouraged to put clean linseed on the market as the customary deductions on account of impurities are made at the time of sale even if comparatively clean seed is brought to the market. The result is that linseed has to be cleaned several times, from the stage of winnowing until it is either packed for export by shippers or crushed by millers. The practice in regard to the preparation for market needs improvement. At present it is calculated that the amount lost in paying freight on dirt and in extra cleaning amounts to at least 3 lakhs per annum in the areas serving Calcutta market alone.

As will appear later no improvement in the present methods can be expected until the non-mutual terms in the buyers' contracts are altered so that sellers of clean produce will not be subjected to deductions on account of dirt when no dirt is present.

CHAPTER V—ASSEMBLING.

A—Methods of Assembling

Linseed is brought to the markets through one of the following agencies —(1) Cultivators, (2) Landlords and village merchants (*baniyas*) (3) Itinerant merchants, (4) Wholesale merchants and Crushers' buying agents, (5) Producers' co operative societies

The approximate share taken or degree of participation by each agency in the assembling of this crop is summarised in Appendix XXII and a detailed description is given below

(1) CULTIVATORS

Cultivators generally prefer to take their produce to the market. Those who have their own carts almost invariably do so and at the same time they may also transport the produce of their fellow growers. The linseed lent at sowing time on the *sauai* ** or "*deorhi*" † systems is collected and well to do cultivators also buy the produce of others. Payment is made immediately or on return from the markets, usually in cash.

The amount of linseed assembled in this way varies in the different provinces and ranges from 10 per cent of the total supplies marketed in Bihar (and Orissa) to about 55 per cent in the Bombay Presidency. On an average only about 20 per cent of the total quantity of linseed arriving in the assembling markets of the country is brought in by the producer in person (Appendix XXII)

(2) LANDLORDS VILLAGE MERCHANTS AND MONEY LENDERS

Supplies also reach the assembling markets through the medium of landlords (*zamindars* and *malguzars*) who take rents in kind from their tenants. In addition to acquiring grains oilseeds etc. by direct purchases the village money lenders (*mahajans* and *sahukars*) and the village merchants (*baniyas*) ‡ also accept the produce in exchange or in payment of their dues. When making purchases the value of the linseed is calculated at a price lower than the price prevailing in the neighbouring market due allowance being made for transportation and other expenses.

Village merchants play a very important rôle in the assembling of linseed, since some of them exercise considerable financial control over the cultivators. The amount brought to market by them is estimated to range from 20 per cent in Bihar (and Orissa) to 55 per

** "*sauai*"—one and a quarter times

† "*deorhi*"—one and a half times

‡ The terms *mahajan*, *sahukar* and *baniya* are to some extent synonymous although their literal meanings differ somewhat. *Mahajan* literally means "a great man" hence a "banker". *Sahukar* also conveys the same sense, deriving from *sahu* meaning "honest" or "respectable". On the other hand *baniya* is literally "a grain merchant".

cent in Hyderabad. Allowing for variation in the conditions obtaining in the different tracts, about 40 per cent of the linseed brought to the markets in India passes through this channel (Appendix XXII)

(3) ITINERANT MERCHANTS

Merchants moving from village to village (known as *beoparis* in Northern India and *lockias* in the Central Provinces) and collecting the produce from the growers are responsible for the assembling of a large proportion of the produce in some provinces. These are village merchants with the difference that the area of their operations lies beyond their own village. In some parts of the United Provinces cartmen also act as *beoparis*.

In Bihar, the cultivators seem to prefer to sell at their door and about 60 per cent of the linseed is disposed of to *beoparis* in this way. Before striking the bargain the *beoparis* take a sample from the heap or, if the lot is in bags by opening a few bags. About 5 seers (10 lb) of linseed are cleaned and the impurity content (refraction) removed and weighed separately. When the price is eventually agreed upon after considerable bargaining the whole lot is weighed over by a hand scale 5 seers at a time. The allowance for refraction is made (a) by placing the refraction as originally separated from the 5 seer sample along with the 5 seer weight on the scale pan so that an equivalent quantity of produce is weighed extra with every 5 seer lot or (b) by deducting the amount of refraction as calculated from the total weight of the produce and paying for the net weight only of clean linseed. During the very busy parts of the season cleaning and allowing for the refraction present in the linseed is not done and *humka* sales are common. This means that the amount of impurity content present is estimated by the prospective buyer by a visual examination of the goods and the total refraction kept in mind when offering the price. After the rate is settled the whole lot is weighed over exactly as it stands. The seller receives payment from the *beopari* at the rate decided upon, without any further deductions whatever. Payment is made either in spot cash in full or a part is so paid and the balance after 5 to 10 days by when the *beopari* has usually sold the produce. In many places in North Bihar the *beopari* has to pay an amount varying from three pias to six pias per bag to the *zamindar* before he can remove the goods from the village.

In Bengal also the producers generally sell to *beoparis* but in the Bombay Presidency where a larger proportion is taken to market directly by producers the amount assembled by this class of merchant is comparatively small.

On the whole the amount of linseed collected by these itinerant merchants would seem to be in the neighbourhood of 35 per cent of the total quantities brought to the assembling centres (Appendix XXII)

(4) WHOLESALE MERCHANTS AND CRUSHERS' BUYING AGENTS

Wholesale merchants and crushers as a rule do not buy in the villages nor do they take an active part in the assembling of lin

seed In the Central Provinces United Provinces and Bombay for example they buy their requirements in the local markets In Bihar and Orissa however the outstation depots or branches of oil mills and wholesale merchants send out representatives to buy in the villages whenever the supplies brought in by the *beoparis* are not considered likely to be sufficient

The quantities assembled in this way would be about 5 per cent of the total marketed (Appendix XXII)

(c) PRODUCERS' CO-OPERATIVE SOCIETIES

There are no producers co-operative societies engaged in the assembling of linseed A few of the co-operative purchase and sale societies in Bombay occasionally deal in linseed along with other produce but the quantities so handled are quite insignificant

B—Markets

Any place or locality in which persons collect with the object of selling any kind of article—whether agricultural or otherwise—may be called a market A market may be held in a place specially set up or built for the purpose or it may grow up on a piece of waste land by the road side or in any other convenient place sanctioned by long usage In India the markets as a rule deal in a heterogeneous variety of agricultural commodities and it is exceedingly rare to find one article one market Linseed is invariably sold in the markets in which trade in grains and oilseeds in general is carried on As comparatively detailed reference to markets have been given in the Report on the Marketing of Wheat in India a brief description only is given here

The markets concerned in the linseed trade fall under one of the following three groups

(1) *Primary markets* are small village markets mostly periodical Linseed is brought to them in comparatively small quantities only

(2) *Secondary markets* are the daily markets in the producing areas to which linseed is brought in larger quantities by cultivators or by the various agencies collecting linseed from the growers These markets are the chief points of assembly centres but in places located near the mills they function both as assembling and distributing centres

(3) *Terminal markets* are those at the ports which draw supplies from the assembling markets in the producing areas and function as distributing centres for the export trade and for the local milling industry

(1) PRIMARY (VILLAGE) MARKETS

In Northern and Central India these small markets are known as *hats* or *panths* and in Madras and South India generally as *shandies*

They are generally held periodically usually once or twice a week and last for a day—buyers and sellers dispersing before nightfall. A wide range of articles is brought in to these markets by itinerant traders and village merchants. The majority of the commodities handled are grains pulses flour salt sugar spices and the daily necessities of life but there are also other wares such as fruit sweet meats cigarettes and tobacco cloth trimmings etc. Their sites are usually on a piece of open land near the village. Shelter from the elements is provided by temporary or semi-permanent structures which are often thatched and sometimes put together with corrugated iron sheets on a wooden framework. Most of these structures can be dismantled and re-assembled without much trouble. Instances when a *hat* has had to be postponed owing to rains are not uncommon.

These village markets play a comparatively small part in the linseed trade as linseed is not an article of food or one of the ordinary daily necessities and consequently entails little retail distribution. The small quantities of linseed brought to the *hats* by cultivators and village merchants are usually bought by the owners of village *ghanis*. In Assam however the weekly *hats* are the only markets of assembly and the buyers are generally village merchants or the agents of wholesale dealers. *Melas* or fairs held during religious festivals in certain parts of India do not figure at all in the assembling of linseed.

(2) SECONDARY MARKETS

The daily or permanent markets are known by such names as *mandis* in Northern India and *gajies* in Central India. They vary to a considerable extent in size layout and the facilities available. A market may consist of just a few merchants or commission agents shops in the buildings lining a public thoroughfare or it may be in a specially laid out rectangular area enclosed by buildings consisting of shops godowns etc. devoted solely to the marketing of agricultural produce of all kinds. The best examples of this type of market are to be seen in the Punjab and in the western United Provinces where they are called *mandis* but they are also encountered in the Central Provinces in Central India and to some extent in Bombay. Most of the markets concerned in the assembling of linseed are generally situated near railway stations.

In contrast to these systematically laid out markets which date from fairly recent times are those which have haphazardly grown up from small beginnings into sometimes places of considerable importance. Typical of these are many of the markets of the eastern United Provinces Bihar and Bengal which conform to no set plan but have simply spread themselves all over the towns in which they are situated often without any regard to the conveniences and facilities which should be available for the proper handling of large quantities of produce. A particularly noteworthy example of this kind of market is Cawnpore in which city the merchants'

godowns and shops are not only in widely separated localities but the actual oilseeds market itself is held along the roadside—a busy thoroughfare—near the railway goods shed at Cooperganj

(3) TERMINAL MARKETS

The real terminal markets for linseed are Bombay and Calcutta* in both of which there is a large spot or ready market as well as facilities for futures trading. These terminals are mainly concerned with distribution. At Bombay, the ready market for oilseeds is located at Dana Bunder where there is a large number of godowns owned privately and by the port authorities. The principal trade organisation dealing with "actuals" or delivery contracts for linseed namely the Grain Merchants' Association has its office nearby. Transactions take place at a particular spot in this market where buyers and sellers or their brokers and representatives meet in the afternoons usually between 12 P.M. and 4 P.M. The futures market for linseed is mainly controlled by the Mirwadi Chamber of Commerce which has recently moved into a large new building on Kalhadevi Road in the heart of the city a considerable distance away from Dana Bunder.

At Calcutta most of the linseed arriving at the port is stock ed in the Port Commissioners' sheds at Kantapukur in the Kidder pore Dock area some 5 miles away from the business quarter of the city where most of the actual trading is done. There is another grain market opposite the Howrah Station in a large shed placed at the disposal of the Indian Produce Association by the East Indian Railway for the purpose of trading in linseed other oil seeds and grains arriving by rail. In this market transactions normally take place between 3.30 and 5.30 in the afternoon. Commissioned brokers and others in possession of railway receipts, are allowed to draw samples of about $\frac{1}{4}$ seer each ($\frac{1}{4}$ lb) from the relative consignments before taking delivery from the railway. The samples are then displayed to prospective buyers when sales are effected on the basis of rates settled under the *purdah* or cover system. The discarded samples left on the floor after the business of the day is over are collected by the railway staff and auctioned periodically the proceeds being credited to the railway.

There are two "futures" trading associations in Calcutta of which the most important is the Calcutta Wheat and Seeds Association with its office and trading ring in Cotton Street. Not far off is the other the Indian Wheat and Seeds Association, which performs similar functions.

Owing to the distances separating the various offices of buyers and sellers and the difficulty of gaining access at times mutually convenient a very large proportion of the business is done over the telephone at both the terminals.

*Vizagapatam has been excluded as it is a port of shipment only for the linseed consigned mainly from the eastern districts of the Central Provinces.

(4) OWNERSHIP AND CONTROL

Markets are usually owned either privately or by local bodies such as Municipal Boards, District Boards or Notified Area Committees. In many instances the right to hold a market or *hat* on private land is acquired by the owner by long usage. A large number of markets in rural areas in the United Provinces, in Bihar and in Bengal, are owned by *zamindars* and are called *zamindari* markets. In such markets, taxes or tolls are levied directly or indirectly on the commodities handled in the market. An example of the former is a charge made on each cart entering the market while in the indirect system each stall or shop pays the market owner a consolidated fee.

The markets owned by local bodies are usually managed by committees and are sometimes leased out to contractors or associations of merchants. For example the Hardingganj* market owned by the Jhansi (United Provinces) Municipality is leased out for a lump sum of Rs 12,000 a year to a *panchayat*† of merchants who reimburse themselves by charging a fee of Re 0.80 per cent ($\frac{1}{2}$ per cent) on all sales made in the market.

In the Central Provinces the village markets are owned and controlled by District Councils who draw up byelaws for their management subject to the approval of the local Government. The arrivals in such markets are subject to a cess the rates being in the neighbourhood of 3 pies for each headload, 6 pies for shoulder loads, known in the vernacular as *lauad*,‡ 9 pies per load carried on pack animals and 2 annas for each cartload. Brokers and commission agents are licensed on a yearly payment of Rs 5 to Rs 12 and weighmen and measurers on payments ranging from Re 1 to Rs 5. The rates which brokers, commission agents and others are entitled to charge are also sanctioned by the District Councils the average being as follows —

Brokerage and Commission	Re 1.40 per 100 bags
Weighment and measuring	Re 0.63 per 100 bags.

The secondary markets or *gunjes* in the Central Provinces are controlled by municipalities and Notified Area Committees, the market sub-committees being composed of municipal members and merchants. In markets of this type one or more of the following charges are levied viz, vehicle toll or tax, octroi terminal tax and road or market tolls.

In the Bombay Presidency some of the markets are controlled by associations of local merchants. For example at Chalisgaon

*Named after a former Viceroy.

†Literally—"a gathering of five elders" usually chosen from among the important members of the community. However, the word does not necessarily imply that only five persons constitute a *panchayat* and in practice a *panchayat* may consist of any number of members.

‡*Kauad*—loads suspended from the two ends of a pole carried on the shoulder. These are known as *Balangis* in the United Provinces and *Banka* in Bihar.

the local Grain Merchants' Association levies a cess at the rate of one anna per cart of produce sold at the market and in return provides the following facilities

- (a) the posting up of the Bombay rates
- (b) the checking of weights and measures
- (c) a kind of tribunal of arbitration and
- (d) the fixing of scales of market charges

In Assam the *hats* are under local boards with the exception of a few in the Sylhet district which belong to *zamindars*. All these *hats* are leased out by auction to private individuals

(5) REGULATED MARKETS

Regulated markets in which the market charges are clearly specified and the usages of trade governed by definite rules and regulations under the provisions of a Markets Act are comparatively few as far as linseed is concerned. The regulated markets in the Bombay Presidency do not figure in the linseed trade while in the Central Provinces where market legislation* was enacted in 1930 it appears the Act has not been applied to the linseed markets. With the introduction of the Agricultural Marketing Act in Hyderabad a few of the markets in that State *eg* Aurangabad Sailu Jalga and Latur have been brought under the operation of the Act. At these markets the produce is weighed by a licensed weighman and a receipt given to the owner. The *arkhatiya* is also required to give a proper receipt when the goods are sold giving the date of the sale the name of the buyer the rate and all other relevant particulars. A copy of these sale receipts (*patris*) is sent to the office of the market committees for reference in case of disputes.

The layout of regulated markets as might be expected is comparatively better and greater amenities are provided for persons using them. They enclose large areas with entrance and exit by metalled roads have sheds for the use of cultivators and brokers and others and arrangements for the supply of water for men and cattle besides generally clean and sanitary conditions. Enquiries in a number of such markets have shown that the proportion of the produce marketed directly by producers themselves is higher than in unregulated markets which shows that the Indian cultivator is by no means slow to perceive the good of beneficial measures.

(6) AREAS SERVED BY MARKETS

Facilities for communication and transport the incidence of duties octroi terminal tax and market charges all combine to influence the volume of trade brought to a particular market. Broadly speaking there is a market of some sort every 10 or 15 miles at which cultivators can dispose of their produce. Where

*The Central Provinces Agricultural Produce Market Act 1935

communications are not well developed instances in which the produce was brought to market from villages 30 or 40 miles distant were frequently met with

The areas served by the port markets of Bombay and Calcutta may extend to as much as 600 miles or more. This is roughly the distance between the districts near Cawnpore and Calcutta and Bombay. Arrivals at Calcutta are drawn from the United Provinces, Bihar and Bengal while those at Bombay derive from Hyderabad, Central India and Rajputana States, Central Provinces and the southern districts of the United Provinces.

C—Persons engaged in assembling

Before discussing the various practices in respect of assembling a brief description may appropriately be given of the persons who function in a typical insect assembling market. The principal of these are (1) *Arhatiyas* or commission agents (2) *Dalals* (3) *Folas* and *Bayas* (weighmen) and (4) *Palledar*.

(1) *Arhatiyas*

The word *arlat* or *arat* means commission and persons or firms selling any goods for others on a commission basis are called *arhatiyas* or *aratdars*. Many carry on the functions of a merchant by buying and selling on their own account. *Arhatiyas* fall into two main categories viz, *kachcha* and *pakka*. The former is usually a person of small means and deals in *kachcha* produce i.e. the produce before it is bagged, graded (where this is done) or made ready for *pakka* or final sale and it is to this type of merchant that the cultivator takes his grains and oilseeds. When the produce has been placed in his charge by the owner the *kachcha arhatiya* assumes the role of a seller and transacts sales on behalf of his client. It should be noted that the *kachcha arhatiyas* pay the seller in spot cash and are themselves responsible for collection of the sale proceeds from buyers.

The *pakka arhatiya* is the true wholesaler and buys and sells on behalf of outside merchants. The *pakka arhatiya* operates on a far larger scale, buys produce through or from the *kachcha arhatiyas* and from other merchants and makes sales to exporting firms, mills, other *pakka arhatiyas* and merchants etc.

The functions of *kachcha* and *pakka arhatiyas* are often carried on side by side under the same roof by persons known as *kachcha pakka arhatiyas*.

(2) *Dalals* OR BROKERS

These are the intermediaries who bring buyers and sellers together. They are entirely concerned with prices and do not actually handle the goods. In some markets however the brokers perform the same functions as *kachcha arhatiyas* i.e., they sell produce on behalf of producers and arrange delivery, payment etc. Brokerage is known as *dala*.

(3) *Tolas* AND *bayas*

Any person pursuing the occupation of weighing is known as a *tola*. A *baya* on the other hand is a person licensed for weighing or measuring by the market authorities. As a class however the *baya* ranks higher than the *tola* as he is generally a person possessing a little capital. *Bayas* were found to be operating mainly in Central India and Rajputana. In some markets they combine their normal functions with those of the *kachcha arhatiya*. Weighing charges are commonly known as *tulai*.

(4) *Palledars* OR *hammalis*

These are the market labourers who attend to the manipulation and handling of the produce in the market. A number of *palledars* work independently in each market and are casually employed as and when their services are required. Others are permanently employed by the *arhatiyas*. The charge paid for handling produce is generally known as *palledari* or *hammalis*.

(5) OTHERS

Numerous other persons perform various minor functions in the markets. These are the waterman (*bhishti*), the sweeper, the watchman, the *arhatiya's* cook etc. who in one way or another administer to the needs of clients and others using the market.

In most of the linseed markets particularly in Bihar and the United Provinces deductions in kind and occasionally in cash are made by the *arhatiya* from the seller's produce to pay for the services of these functionaries. In many instances these deductions are not only numerous but there is evidence to show that in practice far more than the admitted allowances in kind are taken.

D—Market practices

(1) GENERAL

Broadly speaking market practices all over the country are fairly well established by custom. Market legislation in Bombay, the Central Provinces, Madras and Hyderabad has done much to improve conditions in some markets by specifying the various charges and licensing the different functionaries. On the whole however old traditions still persist and undefined practices are being followed without any consciousness that a change is needed.

(2) PROCEDURE OF SALE

The sellers generally reach the markets early in the morning and business is transacted between 8 A.M. and noon, the subsequent hours being devoted to the delivery of the goods and the settlement of accounts.

On arrival the produce is taken to the shop of one or other of the commission agents in the market. The *arhatiya* selected is generally the one with whom the grower or the village merchant

or *beopari* has already had financial or business relations. Although there is no compulsion on the seller to take his produce to the commission agent from whom he had previously secured advances or loans in kind or cash nevertheless the fear that financial accommodation may be withdrawn in the future induces the cultivator to trade through his creditor. The produce may be heaped in front of the *arkhatiya's* shop or allowed to remain as it is brought either in bags or in carts. Sometimes the bags may be unloaded directly into the commission agent's godown. Occasionally a preliminary cleaning of the produce is also done for example in some of the markets of Bengal and Bombay.

The buyers then assemble and before making their offers appraise the quality of the goods by picking up a few handfuls or getting some of the bags opened or by taking out a small quantity with a sampler known as a *paikhi*. (See plate facing page 80). The sample is then examined and its impurities estimated.

Sales are sometimes made e.g. in Bengal on what is locally known as *lasti* basis i.e. after making allowance for the impurity content present. The impurities from a small specific quantity of unseed usually about 5 seer are separated and weighed and an allowance or deduction made from the whole lot on this basis. Owing to the punctilious manner in which the sample is cleaned the deduction from the entire parcel works out in excess of what it would have lost with ordinary commercial cleaning.

The offers of the different buyers are indicated to the commission agent or broker either (a) openly or (b) under cover or (c) by bids in auction according to the system of sale prevalent in a particular market. But whatever the system adopted the price is invariably communicated to the seller before the close of the bargain. He may be a cultivator, village merchant or *beopari* and the latter always has the option either to sell his goods at the rate or reject the offer if he considers it too low. If the offer is accepted the goods are weighed over by the *arkhatiyas'* weighmen and in some places by licensed weighmen. If the seller decides not to dispose of his produce on that day he leaves it with the *arkhatiya* who stores it for him until sold. The produce left with the *arkhatiya* is either stipulated to be sold at the latter's discretion or a price limit is given by the owner below which sales are not to be made. In all such cases an advance is generally made subject to interest at 6 to 12 per cent per annum amounting to about 75 per cent of the value of goods at current rates.

The labour involved in handling up to the stage of putting the produce on to the scale is generally provided and paid for by the seller or the commission agent working on his behalf. Subsequent operations such as removing the goods from the scale filling it into bags or loading on to the carts are arranged by the buyer.

An allowance for impurities etc. is often made during weighing by weighing a fixed extra quantity. For example in Cawn pure linseed is weighed with a 5 seer 3 *chhatankis* weight which

is taken as 5 seers for the purposes of payment. Thus 3 *chhatanks* for every five seers, i.e., 3½ per cent has to be allowed by the seller in every transaction even if the lot contains far less impurities. On the other hand if the goods are adjudged to be very dirty an extra allowance is made in addition to the above. In many markets where it is also customary to make certain payments in kind these are deducted before weighment is completed. After weighment the total value based on the rate previously settled is paid to the seller after making the customary deductions in cash for impurities market charges etc. These vary widely in different parts of India and reference will be made to them subsequently.

As already mentioned the seller is generally paid on the same day by the *arhatiya* who takes upon himself the onus of recovering from the buyer the value of the goods sold to him.

(3) METHODS OF SALE.

(a) *The Cover system*—Where this method of sale prevails the buyer conveys his rates to the *arhatiya* or broker by clasping the latter's right hand under a piece of cloth and indicating by pressure of one or more fingers what he is prepared to pay. Each buyer therefore does not know what his competitor is bidding. When the last bid has been made the *arhatiya* consults the seller and accepts the highest offer. In some places it is customary for the *arhatiya* to announce the offer finally accepted together with the name of the buyer. There are however a number of markets in which the rate accepted is not disclosed to the other buyers. This system is followed for other commodities also and is quite common in some of the markets in the Central Provinces the United Provinces Bombay and Bengal.

(b) *The Open system*—According to this system individual buyers may give offers to the *arhatiya* at any convenient time. These bids are not necessarily binding on the person making them and the *arhatiya* may accept or refuse any offer received during the course of a day. He informs his client the owner of the produce of the highest offer received during normal working hours and should the latter agree the bargain is closed. This system is met with almost everywhere in India. Indeed it is the only system in vogue in Bihar.

(c) *The Auction system*—In markets in which this system is in force buyers assemble at certain customary hours and each lot is put up to auction separately by the auctioneer who is usually the *arhatiya* or broker. Both buyers and sellers are therefore constantly aware of the trend of prices. The highest bid is accepted subject of course to the seller's agreement to sell his produce at that rate. The unit for which bids are made and the lowest bid allowed vary in different markets. The auction system is widely practised in the Central India States the Central Provinces and Bombay and also in some of the southern and eastern districts of the United Provinces.

The different systems have been compared in some detail in the Report on the Marketing of Wheat in India. It is only necessary to say here that each system has certain merits of its own and that if the final bid is openly declared as soon as it is offered, sellers' interests appear to be fairly safe.

E—Market charges

The deductions made from the sale proceeds of linseed brought to the markets are both in cash and in kind and go under a variety of names in different markets and provinces but generally speaking these charges fall under the following main heads —

- (1) Taxes and tolls,
- (2) Commission and brokerage
- (3) Handling and weightment charges
- (4) Charges for other services
- (5) Charities,
- (6) Quality and weight allowances
- (7) Miscellaneous

(1) TAXES AND TOLLS

These include the octroi and terminal taxes levied by municipalities, and the tolls etc. levied by local bodies, owners of markets (*zamindars*) or by market committees. The octroi or terminal taxes payable on linseed in different towns and cities vary from a few pices per maund or a few annas per cart to as much as Re 0 2 0 per maund or Rs 2 per cart. For example in the United Provinces, the Notified Area Committee tax at Bharwa Sumerpur in the Hamirpur district is only Re 0 2 0 per cart while at Benares the octroi duty is as much as Re 0 2 3 per maund. In the Central Provinces the municipal tax at Sihora is as low as Re 0 1 6 per cart whereas at Amraoti, Nagpur and Ellichpur the terminal tax is Re 0 2 0 per maund which amounts to about Rs 2 per cart. High rates of octroi and terminal taxes often affect the arrivals in markets. For instance it was noticed that linseed arrivals at Nagpur market had fallen considerably owing to diversions to neighbouring markets where such charges had not to be incurred. The relative incidence of municipal taxes on linseed and linseed oil also determine whether it is profitable to import linseed or linseed oil into a particular market. The position at Agra may be cited as an illustration. The terminal tax on linseed in that city is the same as for linseed oil both standing at 6 pices per maund. This obviously favours the importation of the oil placing the local crushing industry at a disadvantage.

In privately owned markets tolls are payable both in cash and in kind and vary considerably. For example in the United Provinces the *zamindars* tax at Gonda is Re 0 8 0 per cart and at Hamirpur 3 seers per cart while in the markets of Nanpara, Matera, Resia and Rupadaha in the Bahraich district it varies from 4 to 10 seers per cart. In Bihar the toll rate at Maharajgunj is $\frac{1}{2}$ pie

head also include contributions to the *arkhatiya's* clerks and apprentices and a fee for the making out of invoices and accounts. It is not unusual for the deductions customarily made from sellers under these heads to be retained by the *arkhatiyas* monthly wages only being paid to the different persons so employed.

(5) CHARITIES

The deductions under this head are for contributions towards charitable objects the amounts collected being destined for some specific institutions such as *ganshalas* temples schools etc. or they may be apportioned to different charities at the discretion of the commission agent from time to time. There are usually no definite periods for the disbursement of this money nor is there any check to see that the amounts collected under Charity are actually paid out for such purposes. There is every reason to believe that considerable sums frequently lie to the credit of such accounts (*dharmada*) with various firms the funds being used for trading. It should be noted that interest is seldom if ever allowed to the credit of this account.

(6) QUALITY AND WEIGHT ALLOWANCE

The condition of the produce as it arrives in the market is very rarely clean. All kinds of foreign matter and impurities called *larda* are present in linseed. Allowance is made for these impurities by the buyer taking extra weight which in most cases is a fixed item irrespective of the actual impurity content.

As the produce is weighed over usually in 5 seer units an allowance to compensate for draftage is also made in many of the markets by giving the buyer a small additional amount over the maund. This is known as *dhalta*—literally the turn of the scale—and is usually 4 *chhatanks* per maund.

Deductions for inferiority in quality or for small gram tendered against transactions of bold grain are generally not customary in the small assembling markets being more in vogue in the large distributing centres and at the ports.

(7) MISCELLANEOUS

In some markets a deduction is made called *note batta** if payment be demanded in silver instead of currency notes. Another deduction is made from the seller by the *arkhatiya* to cover him self for the loss of interest caused by his paying cash to the seller and allowing a period of credit to the buyer. This charge is known as *niddat* (literally period).

As a typical example of the various market charges the rates and the schedule of deductions levied at Cawnpore are given below (The largest buyers in this market are the mills). After the rate

*This is a term which came into prominence during the War when silver currency was relatively scarce. Although conditions have now returned to normal this allowance continues in a number of markets.

for a lot has been settled through a *kachcha arhatiya* the cart is taken to the mill and the contents weighed. When the weighment is about to finish, the following quantities are extracted, items (c) and (d) being either retained or distributed at the option of the mill

- (a) 2 handfuls (*angus*) per cart for the mills' *palledars*
- (b) 2 handfuls per cart for the *charhia* (the man who holds the bag near the scale at the time of weighment)
- (c) 4 handfuls per cart for brokerage (*dalali*)
- (d) 1 handful per cart for the mills' clerks (*munimi*)

In addition to the above deductions for distribution to the buyers' employees, the following quantities are also taken from the produce and distributed to the *kachcha arhatiya's* men

- (a) 2 handfuls for the *charhia* (see above)
- (b) 3 handfuls for the scalemen (*nahadar* and *dandidar*)

Thus, 14 handfuls in all are taken from every cart. These so called "handfuls" are supposed to be about 4 *chhatanks* ($\frac{1}{2}$ lb) each but in practice anything from 1 to $1\frac{1}{2}$ seers (2 to 3 lb) is taken. The practice is aptly described by the saying "*Kahat pawa, jai dekhser*" (they say it's a *pao* but actually $1\frac{1}{2}$ seers is gone)

Any quantity under 5 seers that may be left over when weighment is about to finish is not actually weighed but is taken by the buyer at a rough estimate only

After weighment when the owner of the produce returns to the shop of the *kachcha arhatiya* for payment the following additional deductions are made from the weight of linseed delivered to the buyer and the final amount payable is calculated on the net weight arrived at after these further deductions —

- (a) 10 seers on account of *kharch gari* (expenses for the cart)
- (b) 4 *chhatanks* per maund for *karda* (impurities)
- (c) $1\frac{1}{2}$ *chhatanks* per maund to compensate for loss in handling (known as *phanki*)

Having thus arrived at the net weight, the total value is now calculated thereon but before anything is paid to the seller a few more deductions have to be made. These are —

	Rs	a	p	
(a) Brokerage (<i>dalali</i>)	0	4	0	per cart
(b) Charity (<i>dharma</i> or <i>goushala</i>)	0	1	0	per cart
(c) Note batta (if the seller asks for payment in silver)	0	1	0	per cart
(d) <i>Chabani</i> * (food or bet allowance)	0	3	6	per cart

*Actually only Rs 0 2 0 are paid to the cartmen

The buyer pays the *arkhatiya* Re 1 9 0 per cent as commission and Re 0 3 0 per cent for weightment

(8) TOTAL MARKET CHARGES

The amount of the charges, under the different heads enumerated above, payable in a number of typical markets in the linseed producing areas are summarised in Appendices XXIII to XXVIII. These charges represent the expenses involved in entering the market with the produce and the changing of ownership there. The basis for the various charges differs even in the same market. They may be either per maund, per bag, per cart or per hundred rupees and may be payable in cash or kind. In order to ensure proper comparison, the value of linseed has been taken at a uniform rate of Rs 5 per maund and the different charges have been calculated per hundred rupees. Expenses incurred by the seller in transporting the goods to the markets and by the buyer in removing his purchases from the market, are not included in these charges for the reason that these vary with different sellers and buyers in the same market according to the distance the goods have to be carried.

As will be observed, the greater proportion of these expenses is invariably borne by the seller, the buyer's share being comparatively small and in some cases nil.

It will also be seen from Appendix XXIX, that the individual charges in different areas bear no relation to one another. Tolls and taxes appear to be highest in Central Provinces, commission and brokerage in Bengal, handling and weightment in the Central India and Rajputana States and charities in the United Provinces, where the allowance for quality and weight also forms a considerable item in the total expenses. The total admitted market charges are highest in the United Provinces, an average for 10 markets being 6 63 per cent. In the Central India and Rajputana States the average charge for 4 markets amounts to 3 43 per cent and for 4 markets in the Central Provinces 2 98 per cent. The charges in 6 assembling markets in Bihar averaged 2 96 per cent while the lowest average charge occurred in Bombay, the average for 5 markets being 1 78 per cent only.

Market charges in the United Provinces are highest largely because of the practice of levying them in kind in the north eastern districts particularly on account of quality and weight allowances. At Gorakhpur, for example the *dhalla* allowance (draftage or excess in weight) is 1 seer per maund i e, 25 per cent with another 2 *chhatankas* per maund, i e, 0 3 per cent for *karda* (impurities).

In the adjoining province of Bihar deductions for quality and weight are comparatively low presumably because a large proportion of the produce is brought to the markets by *beoparis*, and allowances for refraction etc., are made in settling the rate.

In the Central Provinces the market charges in a number of markets have been fixed by market committees and are comparatively low. Were it not for the high rate of terminal tax at two

markets (Nagpur and Jabhulpore), the average for this province would have been considerably lower

In the Bombay Presidency also the market charges have been fixed by the local associations in a number of markets and it will be noticed that there are no deductions on account of quality and weight allowance

In Hyderabad the total market charges in 3 unregulated markets average 2.49 per cent and in 4 regulated markets 2.25 per cent only. While the tolls, taxes and commission are slightly higher in the regulated markets, charges for handling, weighment and deductions for charities are lower.

F—Finance of Assembling

(1) VILLAGE *baniya*, *mahajan* AND *sahukar*

The cultivator generally depends on the village merchant (*baniya*) or the *mahajan* or *sahukar* (money lender) for all the financial help that he may need from time to time for his agricultural operations and domestic requirements during the year. These advances are usually made on personal security and are payable after harvest. The rate of interest varies according to the standing of the borrower and may be anything from 12 to 36 per cent per annum. When a cultivator is so indebted he has little choice but to take the crop to his creditor and it is not surprising if in the circumstances the latter takes full advantage of the situation. For example in the United Provinces it is quite the normal thing for village merchants to demand from the growers about 1 seer per rupee more than the actual local equivalent of the rate at the nearest assembling market.

Although the cultivator can sell his goods independently and pay his creditor afterwards and is not compelled to sell the produce through or to his creditor, he does so in order to retain the latter's goodwill and ensure the continuance of future favours.

(2) *Arhatiyas*

Sometimes the producer directly approaches the commission agent in the nearest market for financial accommodation and in that case takes his produce to the latter to be sold through him. When the goods are sold the *arhatiya* adjusts his outstandings against the sale proceeds and pays the balance over to the cultivator in cash.

Village merchants and itinerant merchants (*beoparis*) often take advances from *arhatiyas* for making payments for their purchases in the villages and are consequently morally obliged to sell through their creditors.

(3) BANKS

Joint stock banks do not advance loans to cultivators and village merchants on personal security or on the security of crops. They are however prepared to make advances to commission agents

and merchants on the security of pledged stocks of various kinds of agricultural produce (A typical agreement form is given in Appendix XXI)

Before making an advance the banks generally require a hypothecation deed and promise to be executed by the borrowers. The produce must be stored in approved godowns under the banks' locks and insured against fire, the policy being made out in the name of or assigned to the bank. The premiums for this type of insurance vary for different commodities and according to the construction of the storage godown, being anything from Re 0.40 to Rs 1.40 per cent. Linseed stored in a *pakka* godown with corrugated iron roofs free from abnormal risks would ordinarily be insured against fire for Re 0.60 per cent (3/8 per cent). Godowns containing pledged stocks have affixed to the door or other prominent place the bank's name board. Watchmen (*choukidars*) and godown keepers are employed by the banks, as and when necessary to supervise these stocks while periodical visits of inspection are made by the banks' officers. The amount advanced is 70 to 75 per cent of the value of the goods calculated at current rates. If prices fall to such an extent as to reduce the bank's margin appreciably the borrower is called upon to deposit a further sum sufficient to restore the margin to the 25-30 per cent level, or alternatively to give additional goods. Cash credits are generally given for 6 months and in all cases must be repaid before the next harvest. The rates of interest vary in different places and periods. With plenty of cheap money available during the past few years the rates have tended to fall and are now around 5 or 6 per cent.

The activities of the banks are still mainly confined to the towns and large markets. Similar facilities are lacking in the small assembling centres. It must be observed however that far less financial accommodation is required from the banks for linseed storage than for example, for wheat. A rough idea as to the extent of participation by the banks in advancing funds against linseed stocks may be formed from the fact that at Gonda a very important linseed market in the United Provinces 5,917 maunds only or about 220 tons, were pledged with the banks in that town in 1935.

(4) CO-OPERATIVE SOCIETIES

Co-operative societies play an insignificant rôle in the assembling of linseed. The societies in Bihar mainly handle rice those in the Central Provinces and Berar deal in cotton while in Bengal paddy forms the chief commodity traded in. A few only of the co-operative sale societies in Bombay deal in linseed, functioning in much the same way as *arhatiyas* but the quantities handled by these societies hardly exceed 25 tons annually.

The co-operative societies' operations are mainly in the sphere of providing agricultural credit. In 1934-35 there were 9 provincial co-operative banks in different British provinces and one each in Hyderabad and Mysore States. These financed 615 central banks which in their turn financed about 93,000 primary units of which

about 79,000 were credit societies. During the year mentioned loans amounting to about Rs 5 crores were advanced to members. No statistics are available to show what amounts or proportion of the total sums advanced were against the linseed crop.

Loans are advanced on the personal security of at least three members jointly and severally, and are repayable by instalments coinciding with the harvest periods. The rates of interest charged by co-operative societies in different areas are generally lower than the current local rates and during the last year varied between 6 and 12½ per cent.

INTER CHAPTER FIVE

At the assembling markets not more than 10 per cent of the produce of some areas is brought in by cultivators but in other parts the cultivator brings in more than half. It seems clear that where the market charges are few in number and small in amount the cultivator makes greater use of the markets himself but where the charges are high and numerous he is afraid to bring his produce to the market as he is liable to be victimised. He prefers in such cases to dispose of his produce in the village to local or itinerant merchants (*beoparis*) who between them are responsible for assembling about 75 per cent of the linseed.

The market charges are scandalously numerous in some cases and appear to be particularly high in the United Provinces which is a large linseed producing area. In Cawnpore market for example the producer who brings in a cart load of linseed has to part with 14 handfuls (*anjus*) per cart to *palledars*, weighmen, clerks etc. The handfuls are supposed to be about four *chhatanks* but in actual fact range from 16 to 24 *chhatanks*. Apart from that, ten seers are taken on account of expenses for the cart, 4 *chhatanks* a maund for *laida* (impurities), 1½ *chhatanks* a maund as compensation for loss in handling (*phanki*) and the tale has yet to run for he has further charges to pay on account of brokerage (*dalali*), charity (*dharmada*), *note batta* (if the seller asks for payment in silver) and *chabani* (on account of food), on top of which he pays to the *arhatiya* Rs 1 9 0 per cent commission and Re 0 3 0 per cent weightment charges. The poor cultivator must feel himself lucky at the end of the day that he is left with his cart and bullocks to take home.

The total estimated charges on an average of 10 markets in the United Provinces is over 6½ per cent.

In Bombay on the other hand the average of 5 markets was about $1\frac{3}{4}$ per cent only. The high rate of charges in the United Provinces is largely due to the practice of levying them in kind and particularly on account of fixed deductions for *harda* (impurities) and *dhalta* (draftage or weight allowance). In the Central Provinces market charges in a number of markets have been fixed by market committees and are comparatively low, but the high rate of terminal tax at two important markets (Nagpur and Jubbulpore) cause the average to reach almost 3 per cent.

The obvious effect of octroi and terminal taxes are to be seen at Nagpur where the Municipal tax on carts entering the market is Rs 2 and sellers have found it necessary to divert their linseed to other markets where the municipal tax is much lower. In Agra the Municipal tax on linseed is the same as for linseed oil, viz, 6 pies per maund which obviously favours the importation of oil and places the local crushing industry at a disadvantage. It is impossible to over estimate the hampering effects of such burdens on the trade in agricultural produce and there is urgent need for the local authorities concerned to take immediate steps to remove these disabilities.

It is quite clear that in regulated markets the charges are much lower and, as producers themselves make much greater use of such markets, the number of intermediate commissions is reduced. The establishment of regulated markets and the bringing under control of the number and amount of market charges is a matter calling for very early action.

The old problem of indebtedness apparently causes a good number of the cultivators to borrow money from the local *banias* at rates which may vary from 12 to 36 per cent. Unfortunately, there is evidence that when the

takes his linseed later to the same merchant it is quite the normal thing, at least in the United Provinces, that the merchants demand from the growers about one seer per rupee more than the actual local equivalent market rate so that the producer loses both ways

The co-operative societies play no part in the marketing of linseed and it is difficult to know to what extent their accredited operations affect the marketing of this crop particularly

It seems clear however that the activities of the larger banks are still mainly confined to towns and large markets where they do a good deal of business in making advances to *arhatiyas* up to 70 or 75 per cent of the value of the produce lodged in sealed godowns. The amount of linseed so pledged is, however, small. The normal rates of interest in such cases have tended to fall in recent years and are now round 5 or 6 per cent. There seems scope for the banks further extending their activities to the smaller assembling centres

CHAPTER VI—GRADING AND STANDARDISATION

A—Classification.

It was stated in Chapter I that the three main classes of Indian linseed according to the present trade classification depend on the size of the grain and are known as Bombay Bold, Calcutta Bold and Small. It has also been shown that the oil content within certain limits is closely related to the size. The system of classification according to size therefore roughly classes linseed according to oil content also.

(1) EXPORT MARKETS

According to the Incorporated Oil Seed Association contract on which practically the entire export trade is worked tenders of Bombay Bold linseed shall be warranted to contain not more than 25 per cent small grains—any larger proportion being allowed for at the rate of 0.05 per cent for every 1 per cent of such excess. The percentage of small grains is ascertained by survey conducted under the auspices of and according to the rules of the Incorporated Oil Seed Association. For shipments of Calcutta Bold the Association's basis is 145 grains per gramme and any excess is penalised at the rate of 0.15 per cent of the contract price for bold linseed for every grain over 145 with a maximum allowance to buyer of $1\frac{1}{2}$ per cent. This means that tenders of linseed weighing between 146 and 153 grains per gramme are acceptable against Calcutta Bold contracts with an appropriate allowance fixed in accordance with the above mentioned scale.

(2) INTERNAL MARKETS

In the internal trade local usage permits Bombay Bold to be tendered with a content of anything up to 10 per cent by weight of small grains. If the proportion of small grains exceeds 10 per cent but is within the limit of 35 per cent an allowance is payable to the buyer on the excess over 10 per cent according to the difference between the current prices of bold and small linseed. If the small grain content is more than 35 per cent the buyer has the option to reject. For Calcutta Bold the local basis is much the same as in the export markets but certain shippers and millers allow sellers a latitude of a few grains and accept tenders containing up to 152 grains per gramme against contracts for Calcutta Bold. Whatever may be the basis fixed by individual concerns it may be noted that the system of allowances at Calcutta is different from Bombay in that any excess over the basis immediately places the tender into the Small category and the whole lot is paid for at the price of small linseed.

(3) DEFECTS IN THE PRESENT SYSTEM

From what has been said above it will be clear that the standards for the different classes of linseed differ not only as between the export and internal markets but also between the two main trade centres of Bombay and Calcutta. The standard for Bombay Bold linseed is not defined by count as at Calcutta so that to ascertain whether a

particular lot conforms to the Bombay Bold standard or not it is necessary to employ special equipment as used by the survey departments of the trade associations in Bombay. This consists of a sieve and a bottom pan the former being fitted with an arrangement carrying rotatory arms to the ends of which are fitted soft brushes. These brushes bear lightly against the surface of the sieve and as the arms are revolved by means of cogs actuated by a handle the smaller grains are helped through the perforations and fall into the receiver beneath. After being rotated for three minutes by which time all the small linseed should have passed through the sieve leaving the bold. The amount of small linseed is weighed on a chemical balance. This apparatus photographs of which are given opposite page 17 is manufactured by a well known concern in London which specialises in implements used by flour mills maltsters and the grain and seeds trade in general.

The analysis results of a number of commercial samples accepted by trade as conforming to the Bombay Bold standard show that all linseed weighing up to 135 grams per gramme generally falls within this class. The oil content* of these samples in which the number of grains ranged from 96 to 135 grains per gramme was found to vary between 41.34 and 45.48 per cent but according to the present practice all were reckoned as of equal value irrespective of the higher or lower oil content of individual lots. Similarly samples of Calcutta Bold were found to vary in oil content between 40.78 and 43.21 per cent but were paid for at the flat rate current for Bold. The oil content of samples of small linseed varied between 38.28 and 43.42 but for individual samples the buyer paid no premiums or took no discounts for their higher or lower oil content.

The present system of classification therefore falls short of sound trading practice as it leaves a wide margin between the different classes of linseed and does not ensure that the highest quality obtains the highest price.

B—Quality factors

(1) GENERAL

As linseed is primarily required for the expression of oil the main consideration is the amount of oil that can be obtained. The relation between the oil content and the size of grain has already been discussed in Chapter I. Apart from the size of grain the other factors which affect the quantity and to some extent the quality of oil obtained from linseed are the moisture content the amount and nature of impurities present and the general condition of the grain.

(2) MOISTURE CONTENT

The moisture content in linseed varies according to the humidity of the locality and the season of the year. The average moisture content together with maximum and minimum percentages in commercial samples from different provinces and States are given in

*Average of samples from different districts

Appendix XXX from which it will be seen that the variations are comparatively limited in extent. The extreme limits for all the samples tested were 4.48 and 8.45 per cent while the variation in the average moisture content of samples from different provinces and States was found to be between 5.89 and 8.33 per cent. These variations are not detectable by feel or touch and the trade in practice pays little regard to this factor. The effect of storage on moisture content is discussed in the following chapter.

(3) IMPURITIES

The impurities found with linseed are of two kinds (a) Non oleaginous impurities and (b) Oleaginous impurities

(a) *Non oleaginous impurities*—All foreign matter such as pieces of stone lumps of earth straw or chaff wheat gram barley pulses etc. are included in this category. The presence of these impurities in the linseed is due partly to carelessness in keeping the threshing floors clean and in good repair* partly to the practice of sowing mixed crops and in some cases to the deliberate addition of foreign matter. The food grains most commonly found with linseed are gram and wheat owing to the practice of sowing linseed with wheat in some parts and with gram in others. Generally these grains are separated by sieving before the linseed is marketed but owing to the dearth of proper appliances and the lack of sufficient care a thorough job is not made of this operation. Gram and linseed grains are comparatively easy to separate as they are of different shapes but wheat and linseed are both long grained and the bristled or immature grains of the former not being very different in size from linseed pass through the sieves along with the latter. The practice of mixed sowing is very common in the United Provinces and it was often observed in the markets of that province particularly in those areas in which mixed sowings predominated that the wheat offered for sale was mixed with linseed and similarly linseed with wheat. The price fetched in either case was lower than the price of the pure grain so that by his inability or indifference to separate the two kinds of produce the grower lost on both his crops.

The average percentage of foreign matter found in samples collected from different provinces and States in India has been found to range between 1.09 and 8.06 per cent although individual samples and averages for different districts have shown a much wider variation the extreme limits being 0.24 and 25.70 (Appendix XXXI). The highest proportion of foreign matter was found in samples from North Bihar the average being over 8 per cent. Generally the amount of foreign matter in the samples drawn from the provinces and States which feed Bombay is lower than that found in samples from the areas sending linseed to Calcutta. This would seem to be largely due to the fact that a reciprocal contract has been in operation in Bombay for many years which entitles the seller to a premium if his tender is superior to the local standard basis. At Calcutta on

*The tendency for the threshing floors to break up under the hooves of the bullocks treading out the produce has already been referred to in Chapter IV.

the other hand the basis is non mutual so that the seller stands to gain nothing by tendering goods cleaner or superior to the basis

(b) *Oleaginous impurities*—These include oilseeds other than linseed which may be found mixed with the latter and commonly consist of oilseeds belonging to the brassica group of which the most important are rapeseed and mustard and taramira or jambaseed. Two other oilseeds namely niger seed and camelina seed are also occasionally found in linseed. These various oilseeds are most commonly met with in the linseed grown in the United Province and Bihar and consequently are important in the refraction found at Calcutta. The presence of these oilseeds is due largely to the practice of mixed sowings and to some extent to the mixing which takes place accidentally on the threshing floor where all kinds of crops are threshed.

The amount of other oilseeds present in samples of linseed collected from different parts of India show great variations (Appendix XXXI) and it is not surprising that their proportion was found to be particularly high in those areas in which the Brassica oilseeds are widely grown. While the samples from the Central Provinces and Hyderabad averaged between 01 and 07 per cent those from Bihar ranged from 1.57 to 1.95 per cent. In the United Provinces the average was 0.39 per cent in the south western districts 1.60 per cent in the north eastern and as much as 4.27 per cent in the central tracts. The presence of these other oilseeds in linseed lowers the drying qualities of the linseed oil by altering its chemical characteristics since rape mustard and other oilseeds yield semi drying or non drying oils.

Another oleaginous impurity to which attention may be drawn here is castor seed. As it is customary to grow the castor plant on the boundaries of fields particularly in the United Provinces and parts of Bihar castor beans inevitably tend to find their way into the linseed. In spite of the fact that castor seed is readily separable owing to its much larger size linseed with traces of castor seed does reach the assembling markets. This may to some extent be due to the use of old or second hand bags which at some time or other carried castor seed and in which a few beans may have been overlooked. It seems clear however that sellers do not intentionally mix castor seed with other oilseeds. Any admixture of castor seed with linseed is objectionable as the presence of castor husk or seed even in small quantities renders the cake made from linseed deleterious and unfit for consumption by cattle. Such cake is heavily penalised in the export markets and India has paid much too dearly for this carelessness on the part of a few producers and merchants. Since the serious consequences arising out of this impurity are now much better known the position has improved so that only a stray lot or two of linseed containing any castor seed at all now reaches the port markets or the mills at the ports. Some upcountry mills and markets however still get linseed containing this highly objectionable impurity and at times a certain amount of accidental admixture also takes place in the godowns of those mills which crush both linseed and castor seed. It

is significant that consignments of linseed cake, which have been subject to allowances and rejections in the export markets in recent years—not only in India but abroad,—have mostly originated from the United Provinces

(4) CONVENTION DAMAGED GRAINS

Grains of linseed which become wholly or partially discoloured either before or after harvesting, as also grains which do not fully mature, yield less oil than sound grains, owing to chemical changes taking place within the seed by the hydrolysis of the glyceride. Such grains are regarded as damaged and in the trade the terms 'slightly damaged', 'country damaged', 'touched', and 'discoloured' are variously used to indicate the extent of the damage.

The amount of damaged grains present in linseed varies in different localities and seasons depending to a large extent on the conditions and period of storage. The average in the samples from various provinces and States was found to vary from 1.60 per cent in Rajputana to 5.72 per cent in Madras (Appendix XXXI). Damaged grains are generally lowest in the immediate post harvest months but progressively increase as the season advances. This will be clear from the following table showing the average proportions of damaged linseed found in a large number of samples drawn between May and September in the United Provinces, Bihar and the Central Provinces.

Proportion of damaged grains in Linseed found in different months

Samples drawn in	United Provinces	Bihar	Central Provinces
May			2.2%
June			2.29%
July	9.90%	1.00%	2.00%
August	3.90%	2.40%	2.9%
September	4.30%	3.13%	4.70%

It was also found that owing to the susceptibility of linseed to damage by moisture the proportion of damaged grains was relatively higher in places which have a heavy rainfall.

(5) VARIATIONS IN REFRACTION

The total of the non oleaginous impurities (foreign matter) and the proportion of oleaginous impurities (other oilseeds) and damaged grains which is treated as dirt (i.e., valueless) is known in the trade as 'refraction'. The term is therefore not used in quite the same sense as in wheat in which "refraction" refers only to the dirt or foreign matter content.

The amount of refraction varies not only in the samples drawn from different areas but was also found to vary at the different stages of marketing. Enquiries made in various provinces show that merchants consigning linseed to the port markets of Calcutta and Bombay usually give it a preliminary cleaning by passing it over sieves. This is borne out by the following table giving a comparison

of the analysis results of samples collected at the ports and in the producing areas which indicate that the refraction is often much less at the ports than upcountry

Comparison of refraction found in Linseed samples collected up country and at the ports

	Foreign matter	Oilseeds other than linseed	Damaged linseed
	%	%	%
Collected in areas feeding Bombay	4.79	21	2.67
Collected at Bombay Port	2.74	10	3.16
Exported from Bombay Port	2.32	08	2.59
Collected in areas feeding Calcutta	7.25	2.08	2.87
Collected at Calcutta Port	3.16	94	2.01

It will be seen that the average of foreign matter in samples collected in the areas feeding Bombay was 4.79 per cent while the average for samples collected in Bombay itself was only 2.74 per cent. Similarly the results under 'other oilseeds' show a decline from 0.21 to 0.10 per cent. On the other hand there is a slight increase in the proportion of damaged linseed from 2.67 to 3.16 per cent. This may be in part due to exposure and moisture absorbed during handling and transit and storage in Bombay where a high degree of humidity prevails over the greater part of the year.

The position at Calcutta and the areas sending linseed to Calcutta is on the whole similar. The foreign matter content falls by over half from 7.25 to 3.15 per cent and 'other oilseeds' from 2.08 to 0.94 per cent.

A representative selection of export samples drawn at Bombay also indicates that as a result of manipulation in shippers' godowns the impurity content is still further reduced.

It is evident that the linseed is subjected to a great deal of cleaning and dressing—some of it very casual—after the goods come into the hands of the *pakka arhatiya* upcountry and before they are eventually put on board the steamer for export* or crushed by the local mills. But it is not so certain that the quality of the linseed or the condition in which it is marketed undergoes any improvement after it leaves the threshing floor and comes into the possession of the *beoparis* or primary buyer. Conditions were found to be extremely variable for while some producers were seen to exercise great care in the cleaning of their produce in other instances dirt and other impurities separated at the assembling markets were actually seen in the course of transportation back to the villages, presumably in order to be mixed by the *beoparis* and cultivators into other consignments. Owing to the expansion of the oil milling industry in recent years and the tendency to relax the terms and conditions of purchasing adopted by a number of mills resulting from increased competition, instances were observed of a marked deterioration in the quality of

*See page 164

local supplies in markets which at one time used only to despatch to the ports where purchases are made on standard 'refraction guarantee' basis

C—Practice regarding sales

(1) SALES ON REFRACTION GUARANTEE* BASIS

The exporting firms and the large mills invariably buy linseed on what is popularly known as "refraction guarantee" basis, the two usual standards for refraction being 4 per cent and 5 per cent. The former basis is very largely adopted in Bombay and in a few instances only in some of the markets which send supplies to that port. The allowances are mutual which means that the buyer gets paid for any refraction over 4 per cent and the seller for any refraction under 4 per cent. This provides an incentive to tender clean produce and as has been observed, linseed at Bombay contains relatively less refraction than Calcutta linseed.

The 5 per cent basis which is non mutual is in vogue in Calcutta and is adopted by a few mills in the United Provinces and Bihar. In this basis the seller pays the buyer an allowance for any refraction found over 5 per cent but does not receive a proportionate premium on tenders containing less than 5 per cent refraction. Most of the mills in Bengal and all the exporters purchase on the usual 5 per cent non mutual basis but there is one large mill near Calcutta which buys on a basis which is mutual down to 3 per cent. Enquiries have shown that this mill obtains supplies of linseed containing very much lower impurity content than the neighbouring mills or shippers whose purchases being on the non mutual basis offer no inducement to the seller to deliver really clean produce.

For sales made on refraction guarantee basis a sample is drawn from the consignment and the proportion of refraction is determined by methods which will be described later in this chapter.

(2) SALES ON SAMPLE.

The system of sales on sample prevails in a comparatively few markets only and probably less than one tenth of the total sales made in India are effected on these terms. A small representative sample of linseed drawn from the consignment is sent or shown to the prospective buyer or buyers who offer a price on the basis of the sample. The quality of linseed tendered is compared with the sample and if found to differ the buyer has the option of rejecting the goods or accepting them with an allowance to be mutually settled.

(3) SALES AFTER INSPECTION OF THE GOODS

As already indicated most of the sales in the assembling markets in producing areas are made after a visual examination of the goods. Such transactions have no definite basis for refraction and the buyer takes all the quality factors into consideration when offering his price.

*Refraction guarantee basis is the most common system under which goods are sold to shippers. Linseed so bought is subject to analysis the price eventually paid being adjusted to the extent of the refraction found.

In markets where the auction system of sale is customary, the bids are made after the goods have been seen and appraised in exactly the same way. It should be noted however that although the amount of impurities present has been taken into consideration when fixing the price in most cases the seller still has to submit to the various deductions in kind and cash which are sanctioned by local usage and custom.

(4) SALES ON FAIR AVERAGE QUALITY

Sales on fair average quality are uncommon. A small quantity of linseed only is sold on these terms in some of the markets in the Rajputana States and in a few places in the Central Provinces and the United Provinces. When this procedure is employed the *arhatiya* disposes of a number of carts belonging to different sellers in one lot on the basis of the average quality of the whole. This system has little to recommend it as the seller of dirty inferior produce stands to gain at the expense of the owner of clean good quality goods.

(5) SALES ON CONTRACTS

Where contracts are used these fall into four categories

- (a) Mills contracts
- (b) Exporters purchasing contracts
- (c) Futures' contracts and
- (d) Exporters' selling contracts

(a) *Mills' contracts*—Purchases of linseed by the large mills are usually made on written contracts. Some mills have their own contract forms while others adopt the contract forms of one or other of the trading associations. Each Calcutta mill usually works on its own contract (Appendix XXXIII contains a specimen of one contract form) on the other hand most of the oil mills at Bombay have adopted the terms and conditions of the Grain Merchants' Association's contract (Appendix XXXIV). This is a striking evidence of the greater uniformity of trade usages at that port.

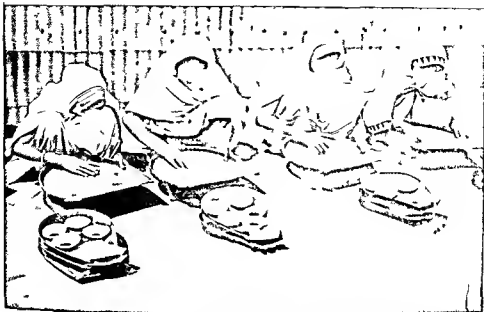
These contracts invariably specify the rate paid, the quantity and quality bought, the basis of refraction, the kind of bagging to be used, the place and time of delivery, the terms of payment, conditions for sampling, weightment and analysis and the settlement of disputes. The chief points of difference are the basis of refraction and the values applied according to the scales of allowances to the different impurities constituting refraction. Other variable factors are the size of the linseed grains accepted against tenders of Bold and the method of weightment, sampling and analysis. Apart from the basis of refraction which is well established as 4 per cent mutual at Bombay and 5 per cent non mutual at Calcutta, a comparison between the terms of the contracts of a number of associations and mills as given in Appendix XXXII will show the extent of dissimilarity existing between the various contracts. To take a few examples while non oleaginous impurities are treated as valueless in every case the allowances applicable to oleaginous impurities are variously computed. For instance "other oilseeds" are reckoned as half the value of sound linseed up to 2 and 4 per cent at Bombay

and Calcutta respectively while above these respective proportions they are regarded as valueless. The scales of allowances for damaged grains are far more variable. At Calcutta the free tolerance for damaged grains in most instances is 1 per cent, while anything between 1 and 6 per cent is reckoned as half the value of sound and over 6 per cent as valueless. At Bombay, on the other hand there is no free tolerance, damaged grains being paid for at half value and slightly damaged at three-fourths the value of sound linseed.

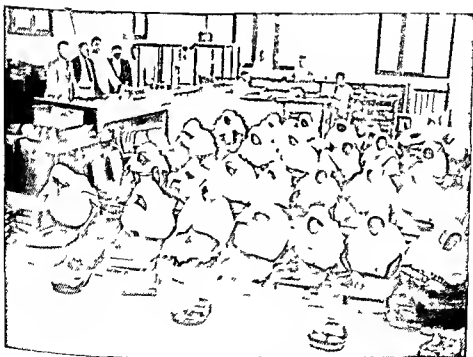
(b) *Exporters' purchasing contracts*—Contracts made by exporters for their purchases of linseed are similar in all fundamentals although they may differ considerably in points of detail and setting out. At Bombay, shippers generally buy on the terms of refraction laid down by the Grain Merchants' Association (a copy of the Association's contract is given in Appendix XXXIV) while at Calcutta each individual firm has its own form of contract a copy of one such contract being given in Appendix XXXVII.

In common with other contracts of this type the terms stipulate the quantity and quality of linseed purchased, the crop year, the price, the delivery period and the point of delivery as well as the packing and the type of bag to be used. (The latter are usually new B Twill gunnies 44 in \times 26½ in weighing 2½ lb each.) Conditions are also laid down entitling the buyer to reject the tender if not packed according to the contract and to repack the lot debiting the seller with repacking charges. Should the containers not conform to the contract the buyers retain the option of returning them to the seller or charging an allowance. The options resting with buyers in the event of sellers' failure to deliver or of short delivery or rejection are specified. The contracts also state the basis and scale of allowances applicable to tenders and the methods of weighing drawing samples and analysis. The terms of payment i.e. by cheque currency notes or silver action to be taken in cases of insolvency and arbitration arrangements are also provided for. A very important clause is that governing the presence of castor seed which generally entitles the buyer to reject the parcel or accept it with an allowance as to which buyers' decision is final.

(c) *'Futures' contracts*—Copies of contract forms used by members of the Marwadi Chamber of Commerce Bombay and the Calcutta Wheat and Seeds Association—the two associations in which the bulk of the "futures" transactions in linseed is transacted—are given in Appendices XXXV and XXXVI. The two contracts as will be readily apparent from Appendix XXXII differ mainly in respect of the basis of refraction, the scales of allowances and the points of delivery. As already mentioned the Calcutta basis is 5 per cent non mutual while that in Bombay is 4 per cent mutual. At Calcutta the point of delivery is at Howrah or Kidderpore Docks (Kantapukur) and at Bombay at the buyer's godowns within defined limits or at railway station. In each case the months of delivery are the same i.e. May and September but the units of transaction at Calcutta and Bombay are 10 and 25 tons respectively. The operation of these associations is dealt with more fully in Chapter IX.



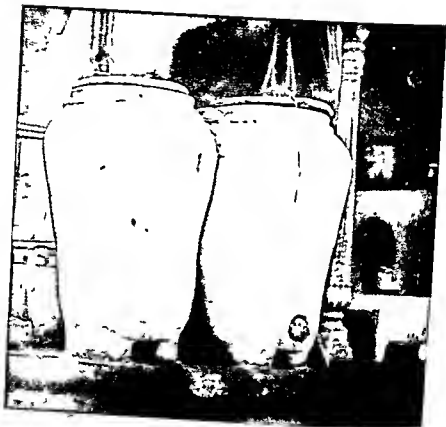
Separating the different component parts in lins-ed samples When separated these are placed in the small round earthen dishes



A typical scene in an exporting firm's analysis department The actual analysis is done by female labour hired on a daily basis.

Facing page 133]

A TYPICAL 'KOTHI'



NOTE.—This type of container is commonly used for storage of oil seed and grain in many parts of India

(d) *Exporters' selling contracts*—The contract used by exporters when selling linseed abroad is almost invariably the contract of the Incorporated Oil Seed Association, London. This association has a standard contract form for shipments to the United Kingdom and another for shipments to the Continent. The two contracts are essentially the same with slight differences in respect of the terms governing payment while for sales to the Continent sellers also have the option to ship from Mormugao in which case the quality of the linseed shipped must be equal to that shipped from Bombay. A special clause is also included in the Continental contract as a precaution against buyers declaring the contract void should the goods on arrival not be found equal to warranties under the basis of admixture.

A summary of the contract form will be found in Appendix XXXVIII and a comparison of some of its main conditions with the terms incorporated in various Indian contracts in Appendix XXXII.

The most important item in which the Incorporated Oil Seed Association contract differs from those used in India is that the basis for Indian linseed is "pure". For the Bombay Bold quality a free tolerance of 25 per cent small grains is allowed by the Incorporated Oil Seed Association contract whereas the local contract in Bombay allows only 10 per cent. In the case of Calcutta Bold the basis is 145 with a scale of allowance for every grain over 145 with a maximum allowance to buyer of $1\frac{1}{4}$ per cent.

It may be observed here that the Incorporated Oil Seed Association's basis for sales of La Plata linseed in Europe is $\frac{1}{2}$ per cent mutual.

D—Methods of sampling and analysis

The methods employed in India as regards sampling are anything but uniform. The size of the sample customary to be drawn in the assembling markets may range from a few *chhatanks* or a few ounces to 1 tier or more (over 2 lb). When linseed is sold after visual inspection of the lot, the small quantity which a prospective buyer picks up from the different parts of the heap or from different bags is the only sample involved and no subsequent sampling is done. For sales actually based on the samples these generally weigh anything from $\frac{1}{4}$ to 2 lb and the method employed to draw such samples is to insert the hand as deep and as near the centre of the heap as possible or when the goods are bagged from a number of bags at the mutual discretion of the parties concerned. These somewhat casual methods of sampling obtain in all the upcountry markets but when sales are made under contracts or under "refraction guarantee basis" as for example to mills or shippers sampling and analysis procedure is far more systematic.

In Calcutta a sample of about 30 Tolas (12.13 oz) is drawn by spear (known locally as *Boma*) generally from 8 to 10 bags per consignment. Sellers have the option to select half the number of bags sampled and buyers the other half. But it was observed that sellers did not always exercise this privilege. This may be due to a peculiarity of trade usage in Calcutta which permits each bag of a lot

tendered to be first examined by the buyer's sampler before the actual refraction sample is drawn. Every bag in the consignment is examined and the bags containing high refraction are marked in a special way known to the person responsible for drawing samples. When the refraction samples are being drawn he makes a point of taking his samples from the bags so marked and is therefore almost sure of taking a sample which contains a comparatively high proportion of impurities. The seller on the other hand has no similar opportunity of checking each bag and so cannot be sure of making a selection to his advantage.

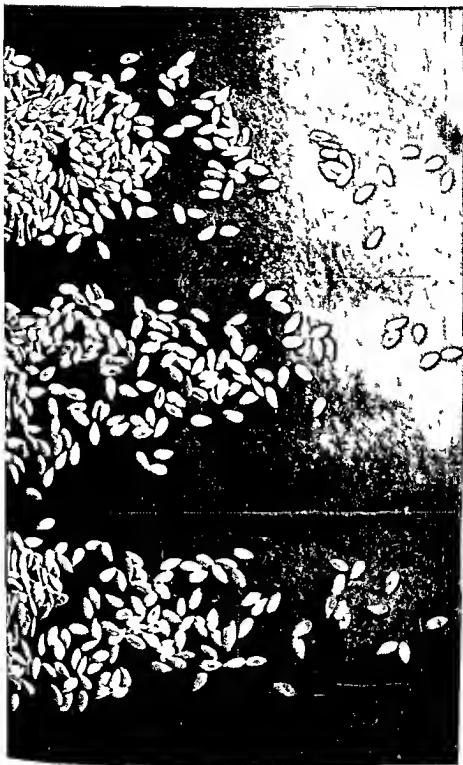
As already stated samples are drawn in Calcutta by a spear of which two types are commonly used. The first is a fairly narrow spear with a closed end and is used merely to examine the quality of the goods. The second is an open end spear or a hollow metal tube of about 1 inch diameter tapered to a sharp point at one end the other end being closed. (Both types are illustrated in the plate facing page 85). The latter is used only for the purpose of drawing samples for actual analysis of refraction. The point is thrust sharply into the desired portion of the bag and the linseed allowed to run through the open end into a small tin or earthenware jar. The sample so drawn from 8 to 10 bags is sealed both by the buyer and the seller if the latter be present at the time.

Buyers usually have a special staff skilled in the drawing of samples and judging the quality of linseed and there is no doubt that experienced samplers are able to draw samples which contain a materially greater proportion of refraction than an untrained or inexperienced person. The fact that shippers and mills employ such men on comparatively high rates of pay is in itself evidence of the skill required for this particular occupation.

When the refraction samples have been collected they are usually taken to the office of the buyer for analysis which may sometimes be made in the presence of the seller's representative but the latter is not usually permitted to come into contact with those employed in the process of analysis. The actual separation of the impurities and the other component parts of the sample including the counting of the grains is done by women who are experienced in this type of work. (See plate facing page 132).

A typical scene in the analysing department of a large exporting firm is also shown in the lower plate facing page 132.

The sample is first run through a set of sieves in order to separate dirt, foreign matter and other oilseeds. These are all carefully picked over by hand. A small quantity is then taken out from the cleaned sample and every individual grain closely examined for signs of damage. Those so affected are set aside according as whether they are wholly or partially damaged, e.g. touched or discoloured, etc. The sample having been split up into its various component parts is now checked over by the godown superintendent or other senior member of the buying firm's staff who then weighs each factor on a chemical balance after satisfying himself that the analysis has been properly done.



BASIS

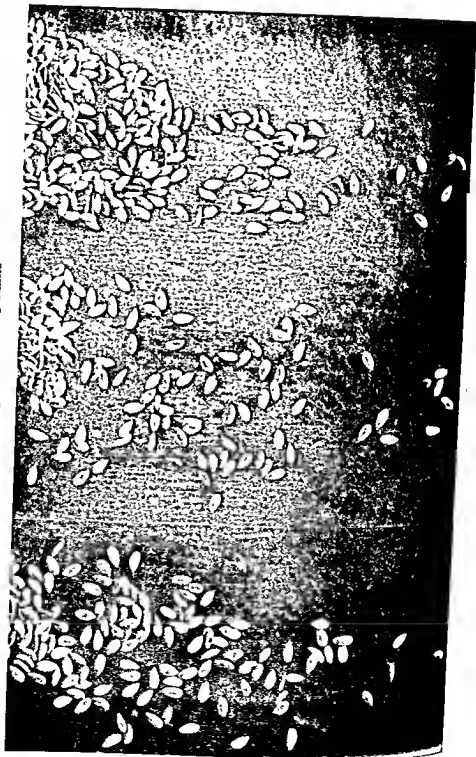
105 grains per gramme

125 grains per gramme

145 grains per gramme

The grains in the illustration represent the actual size

Small lined standards as defined in the all-India standard contracts showing the basis and the higher and lower limits



The grains in the illustration represent the actual size.

In Bombay the method of sampling is different. It is usual for 10 bags to be selected out of each consignment. The bags are so arranged that every alternate bag stands vertically with the mouth upwards while the intervening bags are laid on their sides horizontally with one seam uppermost. (See plate facing page 99). The seams and the mouths of the bags are cut open and 3 handfuls of sample drawn from each bag. In the event of a dispute arising the method of drawing samples by the surveyors appointed for the purpose is as follows.—From the first two bags samples are drawn by the buyer's surveyor and from the next two bags by the seller's surveyor. In this manner samples are drawn alternatively from 8 bags. The 9th bag which is usually lying horizontally is sampled by the buyer's surveyor and the 10th or vertical bag by the seller's surveyor. The actual drawing of the sample when the survey takes place is different from the normal procedure. The buyer's surveyor samples the bags by thrusting his arm up to the elbow, into the produce and stirs the linseed with a circular motion performed 5 times in the same direction or rotation. The hand is then cupped and the arm withdrawn, bringing with it a certain amount of linseed. The seller's surveyor merely samples the upper part of the produce and inserts his hand only up to about the wrist. A sample of linseed drawn in this manner is required by the rules to be not less than 140 tolas (nearly $2\frac{1}{2}$ lb). The sample is now placed in an earthen pot or jar and sealed by both the parties. The actual analysis is done by female labour on much the same lines as at Calcutta except that in order to ascertain the proportion of small grains the special apparatus to which reference has already been made earlier in this chapter is used. It should be mentioned that the hrushes with which this analysing device is fitted are rotated only for 3 minutes.

The absence of uniformity in the methods employed in drawing samples and in analysing them inevitably results in a lack of comparability in analysis results. Under the present conditions it is impossible to compare the results of analysis made at Calcutta with those at Bombay, in the first place because the size of the samples drawn at these two markets is not the same secondly because the methods of drawing the samples are different and thirdly because the procedure in making the analysis lacks uniformity.

As the true grade of a given parcel of oilseeds or grain, or indeed of any other kind of agricultural commodity can only be ascertained by obtaining a representative sample and by following an uniform method of analysis it seems desirable that both the methods of sampling and analysis be standardised* as well as the apparatus used for the purpose of actually making the determinations. It is also essential that the various factors in the sample for example damaged grains should be more clearly defined than is the case at present. What would be regarded as a slightly damaged grain in Calcutta might under the present conditions be classified as wholly damaged in Bombay. This dissimilarity of treatment does not necessarily

*Experiments conducted by the Central Marketing Staff indicate that samples drawn by scoop (see plate facing page 80) gave the most consistent results regarding refraction.

exist only at the ports but also in all upcountry centres it is obvious that as long as these factors lack clear and precise definitions, the analysis results will be open to doubt and negotiation and the cultivator continue to receive less for his produce than should be the case

E—Standardisation

It will be clear from what has already been said in this chapter that the terms of the contracts used in the trade vary from market to market and reflect the conditions of trading which are far from uniform throughout the country. Owing to these various cases it is impossible to compare the prices ruling in the different markets of India. With a view to eliminating these anomalies and in order to ensure a price for linseed commensurate with its oil content as far as possible the following standards for Bold and Small linseed based on the number of grains per gramme* with a system of mutual sliding scales of allowances for the number of grains more or less than the basis were finally approved by the grain and oilseeds trade associations and the oil milling industry after discussions with the Central Marketing Staff in 1937 and 1938.

Bold Linseed—Basis 125 grains per gramme with mutual allowances to buyer or seller respectively, for every grain more or less than 125 grains per gramme at 0.15 per cent of the contract price with a maximum allowance of 3 per cent to the buyer and 1.5 per cent to the seller. Buyers to have the option to reject if the tender contains more than 145 grains per gramme.

Small Linseed—Basis 160 grains per gramme with mutual allowances to buyer or seller respectively for every grain more or less than 160 grains per gramme at 0.15 per cent of the contract price with a maximum allowance of 4.5 per cent of the contract price to the buyer and 2.25 per cent to the seller.

According to this scale the extreme limits for Bold linseed would be between 105 and 145 grains and for Small linseed between 145 and 190 grains. (See plates facing pages 134 and 135). The premium for Bold ceases at 105 grains and the discount for Small at 190. An examination of the diagram facing page 20 will show that the rise in oil content which accompanies the increase in the size of the grain i.e. a lesser number of grains per gramme, does not continue after 105 grains while the diminution in the oil content is not marked when the grains become smaller and exceed 190. This scale of allowance therefore covers a range which embraces the great bulk of the produce which comes on to the markets and it is hoped that when this is brought into effect the price of linseed will bear a closer relationship to its oil content and the producers will get a better premium for quality than at present. The manufacturers will at the same time be able to reckon their raw material costs with a greater degree of precision.

*The equivalent number of grains for Bold and Small types may be stated in terms of the Tola (1 = 11.66 grams)

The other terms of the Contract as approved are as follows -

<i>Refraction* Basis</i>	4 per cent with mutual allowances up to 9 per cent Over 9 per cent cleaning charges to be paid by seller at Rs 3 8 0 per 100 bags plus allowance at full value
<i>Foreign matter (dirt dead seeds and all non oleaginous impurities)</i>	To be treated as dirt, i.e. valueless and included in refraction
<i>Other oilseeds (oleaginous impurities)</i>	Oilseeds other than linseed (except castor seed) to be reckoned as half dirt up to 2 per cent and full dirt over 2 per cent. Castor seed to be treated as dirt
<i>Damaged seeds (externally and internally discoloured)</i>	Up to 6 per cent to be reckoned as half dirt over 6 per cent to 8 per cent at three fourth dirt and over 8 per cent as full dirt.
<i>Slightly damaged or touched seeds (externally discoloured)</i>	1 per cent free Any excess to be reckoned as one fourth dirt
<i>Unit of quotation</i>	Per maund of 82 2/7 lb
<i>Bags</i>	New B Twill bags (2½ lb)
<i>Minimum unit of transactions for futures</i>	500 mannds (Except for Calcutta where the minimum unit is 250 maunds)
<i>Delivery months for futures transactions</i>	May and September

It was also decided that the All India Standard Contract for linseed be put into force for the crop of 1938-39 and that all futures contracts entered into for May 1939—and subsequent months—should be based on the terms of the Standard Contract. The proceedings of the informal conference which took place in April 1938 have been circulated and the latest available information indicates that a number of associations are taking the necessary steps to modify their contracts in conformity with the terms of the All India Standard Contract

*Refraction includes dirt and that proportion of other oilseeds and damaged and slightly damaged seeds which is treated as dirt

INTER-CHAPTER SIX

It is a sad commentary on our marketing methods in India that many people firmly believe dirt and dishonesty to be paying propositions. It is still more unfortunate that as matters stand at present so many of these people are right. Some producers exercise great care in cleaning their linseed but on the other hand *beoparis* have been observed carting dirt and other impurities screened from the product in the assembling market back to the villages to be mixed in again with other lots. They would not do anything so absurd unless they found that it paid. As a first step towards getting the producer better prices it is, therefore, necessary to get rid of these factors which lead to a lowering of the quality of his produce and an increase in the cost of distribution.

The question of impurities needs to be tackled first. These are of two kinds, *viz* non oleaginous impurities consisting of foreign matter such as straw, chaff, earth and grains of wheat, gram, etc., and oleaginous impurities in the form of other oilseeds such as mustard and rapeseed, castor seed, etc. All these impurities are lumped together under the term "refraction" but in the case of linseed, refraction includes the total foreign matter and the proportion of the other oilseeds and damaged grains which beyond a certain point are reckoned as dirt *i.e.* of no value.

The presence of dirt is obviously objectionable but the harmful effects of the presence of other oilseeds with linseed should be recognised. A very small percentage of mustard and rapeseed, for example seriously affects the drying qualities of linseed oil, while it has already been observed that the presence of castor seed husk makes the cake in some cases almost unsaleable.

The average amount of foreign matter found in samples collected from different provinces and States

ranges from $1\frac{1}{2}$ to over 8 per cent (in Bihar) although individual samples drawn from certain districts show a much wider variation and the amount of refraction may even be more than 25 per cent. The proportion of other oilseeds present in the southern areas is low particularly so in the Central Provinces and Hyderabad, but ranges in the United Provinces from less than half to more than 2 per cent in different tracts.

The amount of damaged linseed in the beginning of the season which is about $1\frac{1}{2}$ per cent in Bihar in June, apparently increases as the season advances up to about 4 or 5 per cent in some cases, depending on the extent to which it has been exposed to damage by water in the course of transit and storage.

The total amount of refraction therefore varies from place to place and from time to time but—particularly in those areas where the refraction is high—the amount present is capable of a considerable amount of control. It is evidently necessary to enquire why the amount of refraction is not suitably controlled and reduced. One striking fact stands out, namely, that in the areas serving Calcutta the amount of dirt and foreign matter present is over 50 per cent greater than in those areas which supply Bombay, and further the amount of oilseeds present is ten times greater. The fact that mixed sowings are more prevalent in the former area is not a sufficient explanation of these figures, since in some areas serving Bombay the proportion of dirt ought to be higher owing to the methods of harvesting in vogue. It would, perhaps, be more correct and more logical to say that the reason for the large amount of dirt loaded for the Calcutta market, is due to the fact that most of the trade there has hitherto been worked on a contract which allows 5 per cent refraction as against 4 per cent. in Bombay, but what is more important is that in Calcutta the terms are non mutual whereas in Bombay they are reciprocal and

sellers delivering linseed cleaner than the basis are entitled to claim a premium

It seems clear that anyone selling linseed on the basis of the Calcutta terms would be merely stupid unless he took care to ensure that the amount of refraction exceeded the basic 5 per cent. There is, therefore, ample justification for lowering the basis of refraction permissible throughout the whole of India and making the terms mutual and reciprocal in every case.

Having ensured that clean seed obtains an adequate premium as compared with dirty seed the next step is to secure a premium for high quality linseed over low quality. It has already been observed, when discussing prices, that Bold linseed does not command a price over Small linseed commensurate with its higher oil content. This is perhaps partly due to the fact that the trade make, at present, no clearly defined distinction between Bold and Small seed. Tenders of linseed ranging from 146 to 153 grains per gramme are accepted against Calcutta Bold contracts and the Incorporated Oil Seed Association of London uses as a basis 145 grains per gramme. The count system is not used for defining Bombay Bold but an examination of samples indicates that linseed weighing up to 135 grains per gramme generally falls in this class. The oil content of these different types varies. In the case of Bombay Bold it ranges from $41\frac{1}{2}$ to $45\frac{1}{2}$ per cent but for Calcutta Bold the maximum is about $43\frac{1}{2}$ per cent, and the oil content of Calcutta Small ranges somewhere between $38\frac{1}{2}$ and $43\frac{1}{2}$ per cent. The practice in regard to classifying linseed is very variable both in India and abroad and it is essential that there should be some standard system adopted. At the same time it would also be necessary to arrive at some uniform system of drawing samples from bulk in order to determine the class of linseed and the amount of refraction present. The sampling methods adopted at present in

different places give rise to varying errors and it would be more appropriate to have a uniform system of sampling so that the amount of error would also be uniform and capable of calculation

Discussions which have already taken place between the Central Marketing Staff and the interests concerned, show that manufacturers and the trade are alive to the desirability and necessity of adopting the principle of standardisation, and as a result of these deliberations a system of classification and standard contract terms have been agreed upon, which may be summarised roughly as follows

The dividing line between Bold and Small linseed should be 145 grains per gramme, but the basis for Bold should be 125 and for Small 160 grains per gramme, with a scale of mutual allowances to buyer and seller respectively for every grain more or less than the basis at the rate of 0.15 per cent of the contract price so as to correlate the price of the linseed with its oil content. Maximum and minimum allowances are provided for in each case owing to the fact that the increase or decrease in oil content accompanying the size of the grain holds only within certain limits

Apart from the definition of the different classes the other terms of the approved standard contract provide for a refraction basis of 4 per cent with mutual allowances up to 9 per cent, and beyond this limit, for the cleaning charges to be borne by the seller

The other terms of the contract specify that prices shall be quoted on the basis of the maund (82-2/7 lb) and that the minimum unit of transaction for "futures" should be 500 maunds (excepting 250 maunds at Calcutta) with May and September as the delivery months

When the approved standard contract is adopted and generally applied throughout India, it is anticipated that the producers will secure for their produce a premium commensurate with quality, and at the same time the incentive to adulterate linseed with dirt will be removed and the risks and costs of distribution would be minimised, not only for the benefit of producers but of the traders and manufacturers as well

CHAPTER VII—CONSERVATION

A—Methods of storage in different provinces and States in India

Broadly speaking the methods of storing linseed in India are similar to those adopted for other agricultural commodities. The only differences are those of detail. Linseed is not subject to weevil attack as is the case with food grains. The present survey has however shown that less attention is paid to storage arrangements for linseed than for wheat.

(1) IN VILLAGES

(a) *By cultivators*—Cultivators do not generally retain stocks of linseed beyond their requirements of seed. These supplies are as a rule stored in bulk in earthen jars or pots or in other kinds of home made receptacles made of wicker work etc. which are either portable or fixtures in some part of the house. The opening through which the seed is introduced is subsequently closed after the seed has been filled and made fairly airtight by plastering the joint with mud. Where the material from which they are made is fairly non porous this form of storage appears to be quite satisfactory particularly where care has been exercised in their manufacture and the mouth are sealed against moisture.

The capacity and shapes of these receptacles vary and they are known by different vernacular names which have already been described at some length in the Report on the Marketing of Wheat in India. These may be summarised below—

Kothis kothalis or bharolis—are terms variously applied to large vase shaped receptacles made of mud. (See plate facing page 133). These are kept in a corner of the house their capacities varying from about 2 to 40 maunds. This type of container is found all over the United Provinces Bihar the Central Provinces Rajputana and in Central India States.

Lotnas—These are similar to *kothis* but are made from a kind of wicker work of rice straw and contain from 2 to 3 maunds linseed. This form of storage is encountered in the Central Provinces.

Dholas or dholis—These receptacles are made out of bamboo splits plastered with mud and are erected in the open supported on a bamboo or wooden platform about 1½ to 2 feet above the ground level. They are also thatched on top to protect the contents from rain. The diminutive *dholi* is used to denote a small sized *dholi*. This type of storage is peculiar to Assam.

Bandhas—are shallow dug-outs constructed half above and half below the ground situated wherever possible on elevated land. They are found in the northern division of the Central Provinces and are generally lined with burnt brick or ordinary mud masonry. A lining of *Husa* (straw) is always laid on the bottom and along the sides to protect the produce from damp.

Pauroos—These are similar to the *bharolis* referred to earlier but are made of interwoven bamboo strips plastered with a mixture of mud and cow dung. This type of storage prevails in the Kangra district of the Punjab.

Doolis and mochas—The former are made of bamboo strips and the latter of rice straw. Their capacities range between 10 and 50 maunds and they are found in Assam.

In addition to the receptacles mentioned above baskets and empty kerosene oil tins are also used for storing small quantities of linseed in Bombay and Assam.

Although as noted the greater portion of their linseed is stored by the cultivators in hulk, bags are quite commonly used in Bengal and Madras and occasionally in the Central Provinces, Hyderabad and Bombay.

(b) *By landlords and village merchants*—Landlords and large cultivators store a certain amount of linseed either for lending out as seed or for sale to the owners of village *ghanis* or *kolhus*, known generally as *telis**. Village merchants also retain some of the linseed bought by them or collected from the producers in repayment of advances etc. This class of trader stores either in bulk in receptacles of more or less the same type as those used by the cultivators but rather larger or in bags. It was found however that on the whole bag storage was favoured owing to the greater convenience of handling small quantities so packed.

Where *kothas* are used for bulk storage as in the United Provinces and Bihar some may have a capacity of as much as 1000 maunds but these are rarely encountered in the villages. Occasionally an improvement is effected by placing the bottom of the receptacle about 18 in above floor level thus providing an air passage and preventing the access of damp. At times linseed may also be stored in bulk in rooms called *kothas*. These usually have unpaved floors on which *bhusa* (straw) is spread for protection. A fairly large quantity of linseed is stored in this manner in the villages of Bihar.

Where linseed is stored in bags these are stacked in any convenient sheltered spot but preferably in rooms or godowns with thatched tiled or masonry roofs. The floors of such accommodation are usually unpaved. In Bengal, Bombay and Assam storage by village merchants is almost entirely in bags while in the United Provinces, Bihar, Orissa and the Central Provinces both bulk and bag storage is employed the latter being preferred.

(2) IN MARKETS

As most of the linseed crop moves to the markets within two or three months of harvesting the conditions of storage in small assembling markets are of great importance.

**Telis*—The word derives from *tel* meaning oil and is applied to both oil crushers and dealers.

Unlike wheat linseed is not stored in deep underground pits (*khatris*) but in the rooms of dwelling houses or in godowns. In the smaller markets the floors of the godowns are generally unpaved or overlaid with bricks occasionally plastered with lime and the roofs are either tiled or of masonry. The bags are stacked on old railway sleepers, planks of wood or old pieces of gunnies to avoid direct contact with the floor. In the large town markets storage accommodation is better the godowns having cement floors and masonry or corrugated iron roofs.

Both bulk and bag storage are practised in the assembling markets, the quantity of linseed so stored varying in different places according to local usage. For example linseed is generally stored in bulk in the southern districts of the United Provinces *e.g.* Jalaun where about 80 per cent of crop retained is stored in bulk. In the north-eastern districts of Gorakhpur and Gonda linseed is stored impartially both loose and in bags but in Basti Ghazipur Ballia and Azamgarh bag storage is favoured. Broadly speaking it may be reckoned that about 50 per cent of the linseed stored in the assembling markets in this province is kept in bulk.

In Assam Bengal Bihar Orissa the Central Provinces and Bombay storage is generally done in bags while in Rajputana and in the Central India States of Gwalior Indore etc. bulk storage is more common. In Hyderabad bulk storage is practised to the extent of 70 per cent of the linseed stored.

On an average it may be estimated that between 50 and 60 per cent of the linseed stored in the upcountry markets is in bulk.

(3) AT MILLS

A few mills carry considerable stocks of hagged linseed such purchases being made when supplies are abundant and cheap (see page 84 and the diagram facing the same page). On arrival the different lots of linseed are piled as far as practicable in separate stacks from 6 to 10 bags high. After weighing and delivery the bags are removed and re-stacked 10 to 15 high in the mills godowns. As bag storage facilitates the keeping of records bulk storage is avoided and is resorted to only occasionally to economise space when stocks are large. Some of the large oil mills have considerable storage accommodation in some cases amounting to as much as 8 000 to 10 000 tons. In such mills storage conditions are good but in the majority of instances storage arrangements are not so satisfactory.

(4) AT PORTS

Linseed is invariably stored in bags at Calcutta and Bombay the two main ports receiving linseed from the interior and at Vizagapatam to which relatively small supplies are consigned mainly from the Central Provinces.

At Calcutta all classes of oilseeds and food grains which are booked to the docks are unloaded in the general sheds at Kantapukur unless consigned to a particular shipment shed alongside a loading vessel. A number of sheds at Kantapukur are specially allocated for

linseed This locality holds larger stocks of linseed than any other point of arrival in Calcutta and is therefore the centre of the whole sale trade so far as the actual handling of the goods is concerned. A large number of godowns here are owned by the Port Commissioners, Calcutta. These warehouses are closed on all sides with corrugated iron sheets and are roofed with the same material. They have cement floors and are divided by pillars into bays of about 1 000 square feet floor area. Between 65 and 70 tons can be conveniently stored in each bay when the bags are piled 7 high and double that quantity when stacked 14 or 15 high. The total storage capacity at Kantapuker is about 50 000 tons of which portions are rented out to exporters and other merchants as required. The amount of space so rented varies considerably from year to year according to the demand. A facility offered by the Port Commissioners in connection with the renting of these godowns is that wagons consigned to merchants or shippers occupying rented space are placed alongside the appropriate sections of the sheds.

A large proportion of the linseed stored in Kantapuker is destined for the export market. The Calcutta mills obtain their supplies from this point only very occasionally and the quantities so taken are comparatively small.

In addition to the sheds at Kantapuker storage accommodation is available at the King George Docks and the Garden Reach Jetties but little if any linseed is stored at these places.

The East Indian Railway has lately provided storage accommodation for grains and seeds to merchants on the first floor of the goods sheds at Howrah Station. The floor area of this accommodation made available is 22 560 square feet.

At Bombay the Port Trust has transit sheds and warehouses in the docks themselves and has provided godown accommodation at various places on the land owned by it as for example the Ryan Grain Market, the Grain Depot Mazgaon and the warehouses at Mandvi. The greater proportion of the grains and seeds stocked in Bombay is located in the godowns in the Ryan Grain Market more popularly known as Dana Bunder (*dana*—grain). The Dana Bunder Market and the Grain Depot Mazgaon have shed areas of about 200 000 and 770 000 square feet respectively. These godowns are roofed and enclosed with corrugated iron sheets and have cement floors. They are rented from the Port Trust by merchants and exporters. A number of outside godowns in the same general locality are also owned by shippers and merchants while others again in different areas are rented by these parties from various private owners.

B—Cost of storage

(1) IN VILLAGES

Storage in the villages as already mentioned takes place in the dwelling houses of the cultivators or village merchants. The receptacles used are generally home made at a nominal cost. If however labour were to be employed for the purpose and the material

purchased, the cost for a *kotli* designed to contain about 40 maunds would be about Rs 5 or Rs 6. Such a container would ordinarily last for several years if renovated at the beginning of each season.

(2) IN MARKETS

The cost of storage in the markets varies within wide limits. As a rule the cost is lower in the small assembling markets than in the large centres situated in or near important towns. This is due to the fact that rents as well as labour charges are cheaper away from populous or congested areas. The various charges made in the different areas are as follows. In Bihar, godown rent is normally charged at the rate of about Rs 1-4 0 per hundred bags per month. This works out at rather more than 1 pie per maund per month. In the United Provinces the rate is practically the same. At Nagpur, in the Central Provinces, the charge made by *arhatiyas*, when debiting their clients for this item, is 6 pies per bag per month which is equal to about $2\frac{1}{2}$ pies per maund per month. As it may be assumed that this charge includes a margin for the *arhatiya* the actual cost is probably somewhere between 14 pies and 2 pies per maund per month. At Indore, in Central India, the customary rate is Rs 2 per hundred bags per month which is a little less than 2 pies per maund per month. At a number of other markets in Central India such as at Bina, and in the state of Dewas Senior, the charge is relatively small and amounts to 1 pie per maund per month. In Bombay, the average for a number of assembling markets indicates a charge of 3 pies per bag per month which having regard to the average capacity of a bag works out to about $1\frac{1}{2}$ pies per maund per month. In Hyderabad, the cost of storage in the producing areas is about the same.

It would appear, therefore, that in most cases godown rent up-country is somewhere in the neighbourhood of Re 1 per hundred bags per month or 1 pie per maund per month although in many cases it ranges as high as 2 pies or 3 pies per maund per month.

(3) AT MILLS

Where outside storage accommodation is engaged rents vary with the locality. It was ascertained that the average rents paid are in the vicinity of 3 pies per bag per month which is equivalent to about $1\frac{1}{2}$ pies per maund per month.

(4) AT PORTS.

At Calcutta, the rent charged by the Port Commissioners for storage in the general sheds in Kantapukur is on the following scale—

From the 1st to the 4th week	..	3 annas per ton or part thereof per week or part of a week.
From the 5th to the 8th week	.	5 do
From the 9th and subsequent weeks	7	do

Normally, shed accommodation is leased out at the rate of Rs 60 per 1,000 square feet per month but a reduction may be given for large bookings of space. At this rate the charge works out

to rather less than 6 pies per maund per month if the goods are piled 7 high and about half that amount if stacked 14 or 15 high as is customary when stocks become large. Storage accommodation at Howrah goods sheds may be hired at the rate of Re 0 3 9 per square foot per annum. The rent charged to their clients by *arhatijas* or commission agents in the city is usually at the flat rate of Re 0 1 0 per bag per month *i.e.*, a little over 5 pies per maund per month.

At Bombay the ground rent charges in the Port Authority storage sheds are considerably higher than those at Calcutta being Rs 7 0 per 500 square feet per month while the rent for open yards and open sheds—in which incidentally linseed is seldom stored—is Rs 4 0. The former works out to nearly Re 0 3 0 per maund per month on the basis of 420 bags per 500 square feet and less than Re 0 1 6 if piled 14 or 15 high.

A free period of 7 days is allowed on linseed intended for export after which an extra charge is levied at half the wharfage fee for every three days or part thereof. Wharfage charges in the case of linseed (imported or exported) is Re 1 2 0 per ton. If linseed stored in the transit sheds is not shipped but removed from the dock premises by boat, cart or lorry the rent free period is disallowed and a charge made at the rate of half the wharfage fee for every three days or part thereof. Thus the rent for storage in transit sheds works out at 9 annas per ton per 3 days or Rs 5 10 0 per ton per month *i.e.* over 3 annas per maund per month.

(5) COSTS ABROAD

A precise comparison of the costs of storage in India with those in other producing countries *e.g.* Argentina, the United States of America and Canada is not possible because conditions there are widely different from those in India. In those countries bulk handling and storage is far more common than in India where storage handling and transportation are done to a greater extent in bags. In the United Kingdom one of the principal linseed consuming countries shipments of linseed which are not directly taken into the mill are sometimes stored in Port Authority warehouses whence they are railed to the mills at the latter's convenience. According to the latest available information the charge for storage at port warehouses in the United Kingdom is on an average 4d per ton per week but when rented to merchants on a long term basis or per annum the charge is reduced to about 2d per ton per week. This is not far different to from the charge made for Port Commissioners' sheds at Calcutta but is less than half the rent levied at Bombay.

C—Effect of storage on quality

Linseed is not subject to weevil attack and if adequately protected from moisture and damp it can be stored for a considerable time without deterioration. The ideal conditions are those when it is cool and dry. Experiments have indicated that a hot humid atmosphere tends to increase the amount of free fatty acids. Rain water leaking from defective roofs causes much damage each season.

the precise extent of which is impossible to assess particularly in the upcountry markets of Bengal Bihar and the east of the United Provinces where the rainfall is comparatively heavy and the storage accommodation appears to be comparatively insubstantial and insufficiently weather proof Linseed contained in bag which become wet forms into lumps takes on a darker shade and emits a musty odour

The importance of having damp proof floors cannot be over emphasised Where the floors are unpaved the damp rising through affects the bottom layer of the bags in the stack unless it is resting on sleepers or away from direct contact with the ground Damp causes the bags to rot weaken and burst allowing the line to run out over the floor In Calcutta for instance it was observed that after 6 months storage a number of bags in the bottom layers of many stacks had burst partly owing to the pressure of the bags above and partly to damp although the floors were of cement

Generally speaking linseed does not appreciably deteriorate in quality after 8 or 9 months storage or even after a year provided storage conditions are satisfactory and the linseed when originally packed was sound and dry When newly harvested linseed has a high sheen and is light brown in colour With the lapse of time however the gloss tends to disappear the seed becomes darker and the oil content decreases After about a year or 18 months the change in colour is so gradual as to make it difficult to distinguish linseed stored for one year or so from linseed stored for 2 or 3 years The oil content is only affected to some extent after storage of say not less than 9 months or a year

Just after the new crop makes its appearance old linseed left over from the previous season is rarely bought at the same price as new crop if tendered separately early in the season The reduction in price naturally varies but instances were observed in which the discount ranged from 6 pies to 1 anna per maund In order to avoid this and owing to the fact that newly harvested linseed can very easily be distinguished from the previous crop owing to its brighter lustre and rather lighter colour it is not customary for old crop to be mixed with new To do so would be to invite immediate detection Accordingly therefore sellers usually wait for three or four months after the new crop has been on the market before attempting to mix old with new linseed by which time the original lustre of the new season's linseed has to some extent disappeared and the seed is on the whole rather darker than it was in March or April and differs in appearance very little if at all from linseed which has been stored from the previous season This accounts for the acceptance normally of any linseed which is sound and without marked discolouration The imposition of a penalty or the rejection of a lot is only exercised if the goods are very inferior or unfit for use

It is a fact however that under present storage conditions the oil content is generally found to be about 1 per cent less after the first year's storage and to diminish more rapidly in subsequent years A sample taken from a lot of linseed stored for about 10

years in a village of the Jalaun district in the United Provinces was analysed and found to contain 30.44 per cent oil only. The normal oil content of the linseed grown in this area is about 42 or 43 per cent.

Linseed contains a certain amount of moisture at all times. As supplies come on to the markets during a dry hot period of the year, the seed tends to lose weight as compared with the time of harvest owing to the evaporation of a part of the inherent moisture. Consignments of linseed are largely on the move from up country markets to the ports between March and June. Enclosed in covered wagon and exposed to the sun on the way, the linseed within the wagon is subjected to considerable heat and it is estimated by practical men in the trade that the loss, from the time the seed is harvested to the time it reaches the port in May or June, is somewhere about $\frac{1}{2}$ per cent. When the monsoon sets in, the temperature falls and the humidity increases so that the weight which has been lost between April and June is usually more than made up from July to the end of the monsoon in September. The effect of the natural humidity of the atmosphere on the weight of the linseed is fully appreciated by traders. This is clearly shown by the fact that both buyers and sellers defer or insist upon weighing according to whether the weather is wet or fine. When the rains are over the increase in weight ceases and in the autumn months immediately succeeding the monsoon a portion of the weight gained earlier is lost. To some extent this is regained in the winter period, as will be seen from the following table. To what extent the data quoted were affected by conditions at Cawnpore where the determinations were made, or by any special circumstances is impossible to say, but obviously, variations in weight must largely depend upon the locality and vary with weather conditions.

The following table shows the results of moisture content determinations on 12 samples of linseed between November 1935 and August 1936. The samples were kept in thin cloth bags during the interval between the tests.

Percentage of moisture in Linseed as determined on certain dates

	On 15th November 1935	On 22nd February 1936	On 30th June 1936	On 18th August 1936
A	4.96	6.12	5.28	7.24
B	5.24	6.26	5.74	6.91
C	5.14	6.89	6.05	7.07
D	5.62	6.76	5.78	8.30
E	5.55	6.48	6.25	7.51
F	5.48	6.47	5.80	7.95
G	5.68	6.82	5.76	8.16
H	5.23	6.01	6.28	7.59
I	5.40	6.78	5.95	7.75
J	4.99	6.13	6.04	7.49
K	5.16	6.12	6.20	7.48
L	5.12	6.06	6.22	7.41
Average	5.29	6.32	5.91	7.57
Gain 1.07				Loss 0.38
				Gain 1.63

It will be observed that on an average the percentage of moisture increased by 1.03 per cent between November and February, decreased by 0.38 per cent between February and June and rose again by 1.63 per cent during July and August. The increase in moisture content must be appreciably less when the seed is handled in larger commercial units since the area exposed to the atmosphere is smaller than when dealing with small samples. It is, however, clear that the weight of linseed is susceptible to atmospheric changes and that this must be allowed for in the course of trade.

It has already been pointed out that linseed is not subject to weevil attack. On the other hand, a great deal of damage is caused by rats, by floods and by rain. Rats are known to cause much destruction and loss to stocks. Estimates from a number of sources all pointed to a maximum loss of about 3 per cent in a season. On this basis a very conservative estimate of the wastage for the whole crop would seem to be somewhere in the neighbourhood of 1 or 1.5 per cent. In the port centres such as Calcutta and Bombay rodents are a great nuisance and their destruction by injections of cyanide gas into all rat holes found on the dock premises, occupies the whole time attention of staff employed by the Port Authorities. From time to time outbreaks of plague bring about spasmodic campaigns for the destruction of rats but no systematic action is taken in this respect as is done in the United Kingdom and other western countries.

The extent of damage by floods cannot be estimated. These disasters occur from time to time and it is unfortunate that large linseed producing areas are located in comparatively low lying tracts subject to periodical flooding.

The effect of rain has already been referred to earlier in this chapter. Here again the extent of loss by ineffective storage accommodation cannot be assessed with accuracy. The amount of damage caused by moisture and dampness during storage and transit may be very roughly estimated from the proportion of damaged linseed found in the produce of different districts. Although the presence of defective grains may be partly due to crop damage or damage during the harvesting period it appears to be mostly caused during storage and transportation. The fact that the proportion of damaged linseed is found to be higher in samples collected from merchants than in samples collected from producers and still higher in samples drawn at ports, leads to the conclusion that the amount of damaged linseed increases as the produce moves from the grower to the terminal market, the greatest increase taking place during transit and storage. As a rule, the proportion of damaged grains is higher in the produce deriving from areas of heavy rainfall. For example, a number of samples from Rajputana were found to average 1.6 per cent in respect of damaged grains whereas in parts of the United Provinces the average was as much as 4.5 per cent.

Having regard to the current scales of allowances for damaged grain in linseed which treat damaged linseed as half the value of sound, the net deductions for this factor may be reckoned as 1 per

cent On this basis it would appear that a loss of not less than Rs 5 lakhs was suffered by sellers on the 3,67,000 tons of linseed which were annually exported and consumed by the power mills during 1934-35 to 1936-37 No account is taken in the above figure of the quantity and value of badly damaged or dead grains which are treated as valueless and added to the allowance for dirt

D—Comparison between bulk and bag storage

A comparison between the merits of bulk and bag storage can best be done where both methods of conservation are practised on a large scale at a common centre Such indeed are the conditions in the wheat trade but not as regards linseed where systematic storage for the purposes of investment is on a comparatively small scale and is confined mainly to Calcutta and Bombay where there are terminal markets in which 'hedging' facilities are available In these ports linseed is invariably stored in bags as received from the interior It is not possible therefore to compare bulk and bag storage in the same detailed manner as was done in the Report on the Marketing of Wheat in India

Other things being equal bulk storage should work out cheaper than storage in bags as a large quantity of linseed can be accommodated within a given space Moreover depreciation of the containers is eliminated It is also claimed by a section of the trade that bulk storage keeps the linseed in better condition as only a relatively small portion of the heap is in direct contact with the air and is accordingly less affected by atmospheric changes With bag storage the area exposed to the air is much larger and as the inter-space between the bags permit the free circulation of air more moisture is absorbed in wet weather and conversely more given off when very dry conditions prevail Apart therefore from the greater fluctuations in weight implicit in bag storage there seems to be little to choose between the two systems and in this respect linseed bears a marked contrast to wheat for example which is liable to weevil attack the losses arising therefrom being much greater when bag storage is employed It was shown in the Report on the Marketing of Wheat in India that mainly on account of the weevil loss the storage in bags was almost two and a half times as costly as bulk storage in *lathcha* pits and nearly four times dearer than storage in the new type of underground concrete bins at Muzaffarnagar (United Provinces)

When linseed is brought to the market by producers and village merchants it arrives both in bulk and bags Ordinarily the quality of individual lots in the same market differ only in regard to the amount of impurity content Consequently it would not be impossible for arrivals to be hulled mixed cleaned and eventually stored in bulk at assembling centres up country In the case of food grains the magnitude of the retail trade makes bag storage necessary at many points—if only for the sake of convenience in handling the small lots which are involved Such considerations however, do not affect linseed since the retail trade is quite negligible It seems

possible therefore that if facilities for bulk storage were to be provided in the assembling markets in the shape of suitably designed damp proof structures linseed could be conveniently kept with much greater safety than at present. The goods could be put in bags when required for despatch to ports or mills as transport to ports in bulk would present serious difficulties. A large proportion of the linseed producing areas in United Provinces and Bihar is served only by a metre gauge line and as the flow of supplies is largely to Calcutta transshipment is necessary. Transshipment of linseed in bulk would require very great care owing to its physical characteristics which cause it to 'run' very easily. It would also be necessary to make changes in existing rolling stock to make them fit for bulk transport. This would be a costly undertaking and would necessarily have to synchronise with the development of bulk storage and handling facilities at the ports. Under present conditions such changes are not indicated.

E—Storage costs in relation to seasonal fluctuations in prices

It has already been observed that the rates ruling in Calcutta and Bombay are the key prices for the linseed trade in India and that fluctuations in other interior markets depend largely on the course of values at these two large centres. Generally speaking there is a pronounced decline immediately after the harvest with a consequent rise which culminates in a peak in August/September although in occasional seasons as for example 1931-32 the price level during August/September was lower than in April. The holding of stocks against this seasonal rise is not only undertaken at the assembling markets in the producing areas but also at the ports. Normally the greater proportion of the available supplies up country has been drawn down to the ports by September and at times large quantities may be tendered against the September option.

The cost of storage which is such an important factor in determining the post harvest prices of certain agricultural commodities such as for example wheat does not appear to play such a large part in the linseed trade in which prices are to a large extent governed by the export markets and influenced by the prospects of the Argentine crop and the size of the exportable surplus in that country. It will be seen from Appendix XXXIX that the holder of linseed from April to August/September during each of the past 7 years would have shown a net gain on four occasions and a net loss in three both at Calcutta and Bombay.

From September onwards the only futures contract open for hedging is for new crop in the following May and the course of values bears no relation to the cost of conservation so that the carry in of linseed up to December/January by which time the Argentine crop begins to come on the market shows a net loss which if small is nevertheless significant in all intervening years excepting one at Calcutta only. The occasion referred to occurred in 1933-34 and was probably caused by the abnormally large exports which left very little linseed in India at the end of that year. Moreover the Argentine crop being harvested at the time was a much smaller one

than in the preceding two years. These two factors combined to impart some strength to the position at the time.

The recession in the price level after September appears in a large degree to be caused by the absence of any "cover" against such stocks as may still be left in the possession of holders. This reacts unfavourably on the grower as his surplus produce is put on the market about this time and consequently makes a poor price. As suggested earlier in this report the moving forward of the "futures" delivery month from September to, say, October or even November, might, by spreading the "carry" over a longer period, to some extent correct the tendency for prices to sag in the autumn months. By this means the influence of storage costs in determining the price level at this somewhat critical period would be strengthened without in any way disturbing the normal course of trading.

The approximate returns on stocks of linseed held in up country markets are indicated in Appendix XI which shows the position at seven markets. Storing linseed between April and September appears to be a profitable operation in four of the markets, of which two, viz., Raipur and Nagpur are milling centres of some importance. The extent of net gain in these 4 markets after allowing for carrying costs including godown rent allowance for deterioration and interest at 5 per cent varies from 0.6 per cent to 10.2 per cent. At the other three markets of which Cawnpore is an important milling centre the net loss varies between 0.5 per cent and 6.9 per cent. The carrying of linseed for an extended period up to December shows in all cases a net loss ranging from 3.0 per cent to 14.1 per cent. The wide differences which appear between the returns obtainable in the various markets may be partly due to the unsatisfactory price data available the recording of which has been discussed in Chapter III and partly to the prices at these markets being temporarily influenced by the local demand.

On the whole the seasonal rise in the up country markets is comparatively more pronounced than at the ports (Chapter III—pages 82 to 85). To what extent this may be due to the stabilizing influence of the futures markets at Bombay and Calcutta is difficult to say. The diagrams facing pages 82 to 84 clearly show that there is ample scope for taking advantage of the seasonal rise which in one particular instance was more than 25 per cent, by the creation of some form of controlled sales based on more efficient and increased facilities for the proper storage of produce in the assembling markets. The application of this principle might, with advantage be tried out in Bihar where conditions are less advanced than in many other provinces and where there is relatively speaking far less organised trading in any shape or form than elsewhere.

F—Stocks and storage accommodation

(1) STOCKS AND CARRYOVERS

No records whatever of stocks are kept at any of the interior markets of India. At the ports, however, the port authorities maintain records of stocks in the warehouses rented out by them to the

trade These data are for private use and are not published Detailed records of mill stocks are also kept by some of the mills but the total quantity of linseed for which any reliable figures are available is so small that apart from giving some indication as to seasonal variations they are far from being sufficiently comprehensive to enable any estimation of the stock situation to be arrived at for the country as a whole Such estimates as are made by the trade from time to time are largely founded on intelligent guess work based on long experience of market conditions

The estimated stocks of linseed at Calcutta Bombay in up country markets and in Hyderabad as published in the Indian Trade Journal and referred to in the weekly linseed circular issued by the Imperial Council of Agricultural Research are based on information of this kind supplied by commercial firms and by the Hyderabad State authorities and are given in Appendix XLI In the latter instance the estimated stocks at 5 centres are taken and 10 per cent added to cover the remaining markets It may not be out of place to mention here that the stocks shown against Calcutta in the above publications are not the total stocks at that port but appear to be merely the free stocks available for sale locally Previously acquired stocks held by shippers and mills are excluded from this estimate and the extent by which the stocks registered by the Port Commissioners and those given in the official publications differ will be seen from the following table —

Stocks of Linseed at Calcutta

	(Tons)			
	As given in official publications		As recorded by Port Commissioners	
	1935-36	1936-37	1935-36	1936-37
April	1 266	3 000	9 619	5 265
May	2 750	5 000	4 849	8 904
June	2 250	3 566	7 455	4 601
July	2 000	1 750	3 316	3 899
August	650	2 950	1 345	4 574
September	1 200	2 000	9 085	4 065
October	3 566	1 950	7 599	3 132
November	1 500	560	5 265	8 290
December		275	2 942	8 597
January	2 000	500	4 777	1 949
February	1 250	600	9 269	1 209
March	300	225	1 350	545

Until and unless steps are taken to co ordinate the various sources of information and put the collection of these valuable data on an organised basis so long will these estimates continue to be given little attention by the trading community As matters stand at present a correct or even approximate estimation of carry overs

is impossible and experience has shown that there are usually about as many different opinions as to the probable size of the linseed crop left over at the end of the season as there are business concerns interested in this commodity. In this respect conditions are no different to those obtaining in other agricultural staples.

(2) PERIODICITY

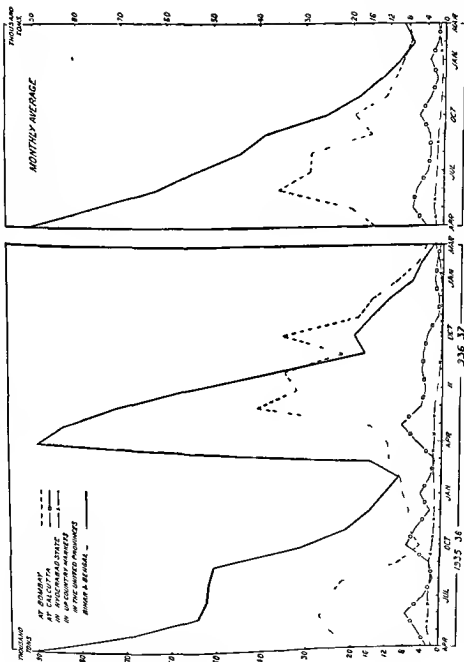
The diagram facing this page illustrates the monthly stock situation in the main linseed areas of Northern India in Bombay Hyderabad and Calcutta and is based on Appendix XLI with the exception of the curve for Calcutta which represents the port authority's figures given on page 105. As an index of actual monthly stocks for the whole of India the diagram is patently incomplete but it serves to indicate the seasonal changes.

It has already been mentioned that generally producers part with their linseed shortly after harvest keeping back only their requirements for sowing the next crop and for domestic use. The extent of this outflow is clearly shown on the steep fall in up country stocks which takes place from April and continues almost without interruption until December. After the new crop has been seeded from October onwards such small balances of linseed as may be left over are taken to the market so that stocks in the villages are frequently exhausted by the end of November or early in December. In many of the up country markets stocks are held up to September or even October by which time most of the remaining surplus begins to move out to the ports and the mills. It will also be observed from the Calcutta curve that the transference of a large proportion of the crop to the ports during the immediate post harvest months results in stocks at Calcutta swelling appreciably during May and June. Thereafter during the next three months when large shipments are going forward port stocks diminish but receive fresh supplies after September when as has been pointed out a large part of the remaining surplus up country is disposed of. The Bombay curve follows the same general trend but the September-November increase in stocks which is a feature at Calcutta is not reproduced at the west coast port. This is probably due to the fact that the linseed crop of Peninsular India which is some weeks earlier than that in the north exhausts itself sooner.

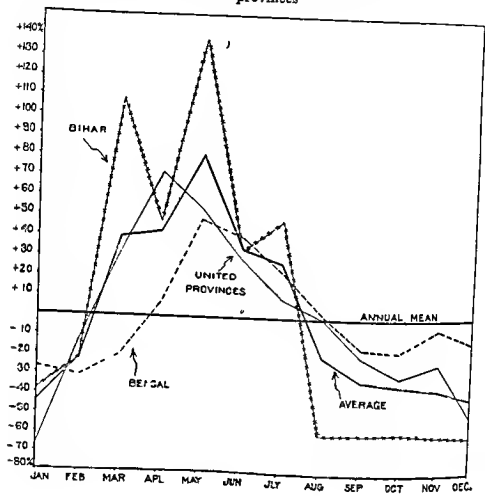
It is interesting to observe that stocks in the Calcutta port warehouses usually vary from year to year in direct proportion to the volume of exports as will appear from the following table —

	Average daily stocks (Tons)	Total exports from Calcutta (Tons)
1931-32	3 564	76 000
1932-33	2 898	47 000
1933-34	194	188 000
1934-35	1 97	97 000
1935-36	3 68	87 000
1936-37	3 317	119 000

ESTIMATED STOCKS OF LINSEED



Seasonal variations in Linseed stocks at certain mills in different provinces



The maximum and minimum daily stocks in Port Commissioners' Sheds, Calcutta, since 1931-32 are shown below. It will be seen that with the exception of the two years (1933-34 and 1935-36) when the peaks occurred in September and October respectively the tendency is for stocks to be highest in May and June. Stocks are generally smallest in March and there is a very large difference between the high and the low of each season.

Maximum and minimum stocks of Linseed at Calcutta in Port Commissioners' sheds

	Maximum Tons	Date	Minimum Tons	Date
1931-32	8 845	4th June 1931	453	25th February 1932
1932-33	5 926	18th May 1932	1 137	17th March 1933
1933-34	15 677	18th September 1933	412	31st March 1934
1934-35	12,203	20th June 1934	412	26th March 1935
1935-36	10 290	23rd October 1935	944	9th March 1936
1936-37	10 788	10th May 1936	318	19th March 1937

Supplies of linseed carried by different mills must obviously depend upon the buying policy of the management and the storage accommodation available. As a rule most of the larger concerns cover the bulk of their linseed requirements during the two or three months following the harvest when supplies are plentiful and prices generally at their lowest. As will be seen from the diagram facing this page, mill stocks tend to be highest from April to about June and lowest in December, January and February prior to the arrival of new crop supplies. The slight rise which will be noticed between October and November is due to the replenishment of stocks consequent on the depletion of earlier supplies which are crushed during the monsoon months to meet the autumn and cold weather demand for oil.

(3) TOTAL STORAGE ACCOMMODATION

At the ports, warehouses and godowns are usually owned by the port authorities and located within the docks and are directly served by the railways. Rents are also comparatively high in the congested areas which normally surround the docks so that generally there is little inducement for merchants and shippers to seek storing space away from the facilities offered by the port authorities. Stocks tend therefore to concentrate within specific areas. Up country where rents are much cheaper, there are seldom any localities exclusively set apart for storage. Any kind of accommodation so long as it is sheltered and can afford reasonable protection against the elements is pressed into service when the necessity arises. It will be appreciated therefore that storage accommodation in India is elastic in the extreme. The total amount of storage space at the disposal of the Bombay, Calcutta and Vizagapatam port authorities is sufficiently large to accommodate the entire Indian linseed crop if need arose. At Calcutta the general sheds at Kantapukur alone would house 50 to 60 thousand tons of linseed exclusive of other warehouses in other parts of the Port Commissioners' estates.

INTER CHAPTER SEVEN

Apart from what is required later for sowing the cultivators do not generally store linseed, but dispose of it as soon as possible after harvest. At the up country markets large quantities of linseed are stored generally in godowns or in the rooms of dwelling houses adjacent to the markets. A good deal is also held in sheds at the large mills and the leading ports. In Hyderabad, it appears that over 70 per cent of the linseed is stored in bulk but in other parts bag storage is the rule. In the case of wheat and other food grains, there is some justification for handling the grain in bags as this is more convenient for the small internal retail trade. But in view of the large quantities of linseed going into the export trade and the almost complete absence of retail business there is not the same need for the use of bags.

Bulk transportation would, however, present certain difficulties. No. 11 Bihar, for example, which is a large linseed producing area is served by the metre gauge and the produce has to be transferred on to the broad gauge railway for transport to Calcutta. Further, the grains of linseed are so fine that they would be liable to leak through a bulk storage wagon. Nevertheless there seems some justification for bulk storage in the up country markets in so far as it is cheaper and the linseed is less liable to damage. The linseed could be put into bags later for transport.

Linseed is not subject to weevil attack but is very susceptible to damage by rats and water. The damaged grains not only give a lower oil content but also a poorer quality of oil owing to the presence of free fatty acids. Under good storage conditions there should be no deterioration whatever in the quality of linseed for at least 8 or 9 months—and indeed it can be stored for well

over a year without any deterioration. It appears, however, that under the present conditions of storage the amount of damaged grains and the free fatty acid content increases as the produce approaches the port, and it is estimated that in respect of the quantities shipped and crushed in the larger mills the damage due to moisture—which varies according to the seasons—amounts to over Rs 5 lakhs per annum which seems to indicate the need for paying more attention to the roofs and floors of existing godowns and sheds.

The costs of storage upcountry are lower than at the ports. Bombay is particularly high but the costs at Calcutta appear to be not out of line with costs of storing at, say, the ports in the United Kingdom. The seasonal fluctuation in price is apparently sufficient to cover the costs of storage up to September, but storing beyond this point does not seem to be a paying proposition. This is owing to the fact that after the September "futures" contract closes at Bombay and Calcutta there is no adequate cover until the May contract, the price of which is determined by the prospects of the next season's crop and particularly by the extent of the Argentine crop.

Having regard to the relative cheapness of storage upcountry and to the very large seasonal movement in prices which occurs in certain parts, *e.g.*, 25 per cent in North Bihar, there seems reason to believe that in such areas some form of organised marketing, say on a co-operative basis, might help the cultivators over the deepest part of the harvest-time depression. There is, however, an obvious danger in trying to hold stocks upcountry too long. At the same time it should be recognised that there is an almost equal danger in piling up too large stocks at the ports, particularly at Bombay in the absence of an adequate milling industry there.

The total amount of storage space at Bombay, Calcutta and Vizagapatam alone is sufficient to accommodate the whole linseed crop—and the accommodation available upcountry is elastic in the extreme. There are very few clearly defined storing centres. It is, therefore, a difficult matter to arrive at the total linseed stocks in the country at any time.

Estimates of stocks at Calcutta, Bombay, in Hyderabad and in upcountry markets, based on such commercial and other returns as are available, are published weekly in the Indian Trade Journal but are clearly incomplete and of uncertain accuracy. The Calcutta stock figures, for example, do not tally with those in the Port Commissioner's godowns which include, however, linseed sold and awaiting shipment. There is urgent need for the co-ordination of stock reports from the various centres and for more definite machinery for the regular recording of stocks in the principal markets. In this respect linseed does not differ from most other agricultural commodities.

CHAPTER VIII—HANDLING AND TRANSPORTATION

A Handling

(1) ON THE FARM

In the main linseed producing tracts of the country, namely, the United Provinces, Bihar and the Central Provinces, linseed is often sold directly off the threshing floor, weighment or measuring being generally done by the buyer or sometimes by village weighmen or measurers. Such produce as is not disposed of on the holding is carried by the cultivator to his home or to the market in head loads on pack animals or in carts according to the quantity involved and the distance. Before taking the linseed to the market the cultivator frequently gives his produce a certain amount of casual dressing over by means of hand sieves in order to eliminate the bigger lumps of earth etc., which happen to get mixed up with the linseed during threshing and which, owing to the inefficient methods of winnowing dependent entirely on the strength of the wind remain in linseed. It was observed however that no special care was exercised to rid the produce of its various impurities, nor indeed was this possible having regard to the primitive and often defective nature of the cultivator's equipment. It may not be out of place to mention that the analysis of samples drawn from producers show a smaller percentage of impurities than those drawn from other agencies in assembling markets. This indicates that when linseed is purchased by the village merchants and *beoparis* from growers it is often adulterated by the addition of a further proportion of dirt before being transported to the markets.

The major part of the crop is handled in bulk until it reaches the markets, only a small portion being packed in bags, old second hand gunny bags of all types being pressed into service for the purpose. For bulk handling, sheets of strongly woven fabric made from hemp, coarse wool or cotton are used to form containers to fit on to the backs of pack animals or to make a lining for carts.

The cost of handling at the farm is negligible as these operations are always performed by the cultivator and his family.

(2) AT THE MARKET

At the markets the various operations such as unloading filling in bags, etc., are generally performed by labourers called *hammals* or *palledars* who specialise in these tasks, and by professional weighmen, measurers and cartmen. When the produce is brought to the market in bulk, it is filled into the buyer's bags after cleaning and weighment and if brought in bags, the contents are usually transferred into the buyer's containers. A small hand scale weighing about 5 seers, at a time is almost invariably used. During the process of weighment the linseed as it is being put into the scale pan is dressed in a rough and ready manner by the process of *rulai* (literally—"rolling") in which the heap is stirred by a circular motion of the hands, causing the impurities to sink to the bottom or roll down the sides. This operation is almost invariably performed by female labour. In most

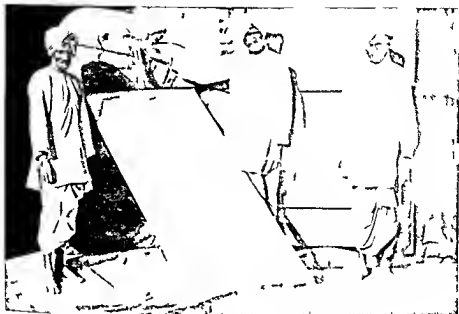
cases the produce when bagged and brought to the market is packed in irregular weights. After weighment however, it is filled into bags of approximately uniform weight.

The charges for the various operations have already been discussed in detail in Chapter V. Suffice it to say here that the handling and weighment charges in different markets vary from about Re 0.30 per hundred rupees worth of produce to over Rs 2.80.

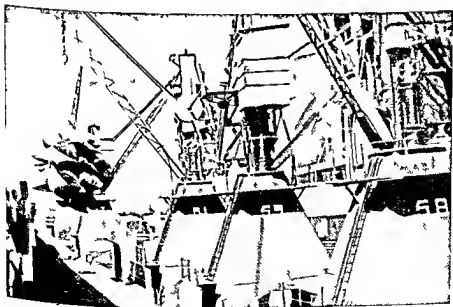
When the linseed from the majority of the upcountry markets is sent down to the ports it is rarely despatched in the condition in which it is bought from the producer. A certain amount of additional handling and manipulation is done to prepare it for the port markets and the cost of these operations averages between 3 to 6 pies per bag. Briefly the procedure is for several small heaps to be piled together in the commission agent's or wholesale merchant's godown. The heaps are then mixed sometimes with large rakes in order to obtain fairly uniform refraction throughout the lot and the produce is subsequently run over large sloping screens. (See upper plate facing this page). The extent of the cleaning done depends largely as to whether the linseed is being consigned to Calcutta or Bombay. Enquiries have shown that the impurity content of the linseed can at this stage easily be reduced to about 3 per cent without involving any additional cost over and above what is at present being incurred. Owing to the basis at Calcutta being 5 per cent refraction non-mutual* no attempt whatever is made by merchants and others consigning goods to that port to bring down the proportion of impurities below 5 per cent. As no premium is paid for linseed containing less than 5 per cent refraction the proportion of impurities is usually kept well above that figure. Indeed the average impurity content in the linseed which reaches Calcutta from the United Provinces and Bihar is generally somewhere in the neighbourhood of 6 or 7 per cent and quite frequently exceeds the latter figure. On the other hand it is significant that the amount of refraction in the linseed consigned to Bombay is lower. To what precise extent this is due to the fact that the Bombay contract is a mutual one on a 4 per cent basis is difficult to state. The difference in condition between arrivals of linseed in Calcutta and those in Bombay is however so marked as to indicate that the Bombay terms are a definite inducement to market the produce in a comparatively cleaner state.

The handling customarily performed in the markets of the northern districts of the United Provinces and in Bihar still leaves in the linseed a removable surplus of anything from 2 to 4 per cent of impurities. This dirt and rubbish is transported to the ports at a freight cost which on a conservative estimate may be placed in the neighbourhood of at least Rs 2 lakhs per annum. It has eventually to be eliminated to some extent prior to shipment and involves further cleaning costs.

*A large mill near Calcutta buys on a 3 per cent mutual contract and thereby obtains far cleaner produce than is ordinarily railed to Calcutta for the wholesale and export trade.

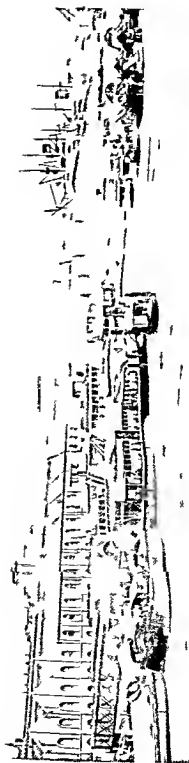


Cleaning linseed in an upcountry merchant's godown by means of a sloping screen



Loading linseed at the Bombay docks

A Calcutta river scene showing in the foreground a river steamer and a collection of flats and barges used for transporting produce



(3) AT RAILHEAD

Linseed brought to railhead is always packed in bags, generally of fairly uniform weight. Practically all the consignments destined for the port markets are packed in "B Twill" and "Heavy C" bags, a description of which is given later. When the bags arrive at the railway station, they are unloaded from the vehicles employed for the purpose (usually bullock carts and sometimes lorries) and manhandled into the railway sheds. This is done by cartmen or other labour employed by consignees. The cost of unloading from carts or lorries into the railway sheds varies at different stations, ranging from Re 0-4 0 to Re 1 9 0 per hundred bags.

Railway sheds are generally covered at all the more important stations, but an insufficiency of covered accommodation at various places was complained of by the trade in the United Provinces and Bihar.

After arrival, the goods are usually loaded into wagons within 24 hours. The charges for loading and unloading are included in the railway freight, these services being performed by labour employed by the railway. The method of hiring labour for this purpose differs from one railway administration to another, for instance on some railways *hammals* are engaged on monthly wages varying from Rs 10 to Rs 22 per month while on others, labour is provided by a contractor on rates varying, at different stations from Re 1-4 0 to Rs 3 per 1,000 maunds handled. In certain instances unloading charges are not included in the freight and the unloading is done by the consignees, for example, for wagons hooked to mill sidings.

The use of hooks is not permitted by the railway administrations but the rule is honoured more in its breach than in its observance particularly at stations where transshipment takes place from narrow to broad gauge lines. This results in the bags being torn and part of their contents lost. In a commodity such as linseed which has a smooth and polished surface and "runs" easily the loss occasioned by torn containers may at times be very considerable. The railway staff at an important transshipment station in Bihar estimated this loss to be about 1 per cent. Obviously this proportion increases with further handling down to the port.

The clearing and booking of consignments are carried out through station *dalals* (brokers) or *hundikars* who act for consignees and consignors on payments of small fees of about 4 annas per consignment.

(4) AT RIVER GHATS

Traffic on waterways is confined mainly to the United Provinces, Bihar, Bengal and Assam and represents a negligible part of the total volume of the movement of linseed. The loading and discharge of the goods is done by coolies at charges varying from about 2 pies to 4 pies per bag at different places. Many of the individual ghats, at which loading and discharge takes place, are under the management of contractors who obtain these rights by purchase at auctions held

either by the Public Works Department or by Local Boards. The cost of such a contract varies according to the importance of the ghat. It may be as little as a few hundred rupees per year or as much as Rs 80 000 as for example Burtghat at Gorakhpur. Contractors are allowed to collect a toll on all despatches and arrivals at the ghat concerned. Except at steamer ghats and a few of the other larger ghats no cover is provided in the way of shed.

(5) AT PORTS

The only three ports concerned in the linseed trade are as already mentioned Bombay, Calcutta and Vizagapatam. A small proportion only of the linseed arriving at the ports from the interior markets is exported in the same condition as received and another handling similar to but often more elaborate than the treatment given upcountry is resorted to. Generally shippers have to open the bags and clean the contents by passing the linseed over sloping screens and through wire mesh sieves which are suspended from wooden frames in such a way as to permit them to be oscillated to and fro by manual labour. Several individual lots or consignments are bulked and thus treated in order to make up parcels of fairly uniform refraction for shipment. The goods are then repacked in gunny bags to a standard weight of 180 lb net each. The cost of cleaning varies from 6 pies to Re 0 1 0 per bag depending on the cost of labour and the cleanliness or otherwise of the linseed being handled. The total expenditure incurred by shippers and others in these cleaning operations at Calcutta alone during 1936-37 could not have been less than Rs 50 000 and was probably nearer double that figure. This takes no account of the additional space required all of which has to be hired and paid for.

Loading into steamers is done by means of cranes, a typical dock side scene being illustrated in the plate facing page 169.

Normally linseed is exported in bags but since 1933-34 shipments from Bombay to the United States which are always in full cargoes have been in bulk. The produce is handled at the dockside in bags but once on board the bags are cut open at the mouths and the contents emptied down the hatches into the hold. Manual labour is employed for the purpose. This method of transportation is made possible by the fact that the mills in America which buy Indian linseed are equipped with suitable facilities to deal with bulk shipments, the vessel discharging directly into elevators. Bulk shipments incidentally mean a saving in freight and other incidental expenses to the extent of Rs 2 or Rs 3 per ton.

(6) CONTAINERS AND POSSIBILITIES OF HANDLING IN BULK

As has been noted earlier linseed subsequent to its leaving the assembling markets is handled in bags until it is ultimately consumed in the country or exported abroad. It is only when the produce moves from the farm to the market that a portion of it is handled in bulk.

As with other oilseeds and food grains the bags used in the linseed trade are manufactured from jute and are popularly known as gunnies or gunny bags or by such vernacular names as *bora basta* and *bardana*. These are principally manufactured by the

jute mills at Calcutta but there are also two mills at Cawnpore and mills in the Madras Presidency at Nellimarla and Chitavala. The most common type of bag used for exports and for supplies consigned to the mills at the ports is the B Twill. This bag measures 44 in \times 26½ in, has three blue stripes running down the middle and weighs 2½ lb. Another type sometimes used is called the Heavy C. This is a plain bag without any stripes measures 40 in \times 26 in weighs 2½ lb and costs a little less than the B Twill. The convenient capacity for both types for linseed is 2½ maunds (16½ lb). The tires of B Twill and Heavy C bags are commonly reckoned as 1 seer 2 *chhatanks* and 1 seer respectively the former being equivalent to a little more than 23 lb and the latter to 20½ lb. In the internal markets several types of bags are used the most usual type being the smaller D W (double warp) bag which holds 2 maunds only. In the interior the prices of linseed are generally quoted without the bags while at the port markets and for the export trade prices are inclusive of the cost of new B Twill bags. For the greater part of 1937 the price of B Twill gunnies at Calcutta has averaged about Rs 21 per 100 bags.

B Transportation

The cost of transport is largely responsible for the difference in price between the upcountry and port markets. The values ruling at the port terminals of Calcutta and Bombay are the basic or key prices of the linseed trade in India and the cost of transport is the most important individual factor accounting for the difference between the prices at these two centres and those obtaining in other markets.

Transportation is effected (1) by road (2) by rail and (3) by water.

(1) BY ROAD

(a) *Pack animals*—Practically all the roads from the villages to the markets are unmetalled or *kachcha* and in some cases are mere tracks winding in and out between the fields. During the monsoon these are rendered quite impassable. Pack animals and bullock carts are the only means of transport on these routes. The quantities carried by animals are generally small and vary according to the condition of the road, the season and the strength of the animal. Bullocks normally carry from 2 to 4 maunds each, ponies from 1 to 3 maunds and camels from 4 to 7 maunds.

(b) *Bullock carts and camel carts*—The ubiquitous bullock cart is still the most important means of transport by road. The carts used in India are of crude construction having wooden wheels in some instances shod with iron tyres. These carts are of several types. Some are two wheeled while others have four wheels. They may be drawn by one, two or even three bullocks. The capacity of a cart may vary from 8 to 40 maunds depending on such factors as the number and size of bullocks used and the condition of the road, etc. In the rural areas of Northern India and particularly in the Punjab the carts are large in size, have two wheels and are drawn by two bullocks occasionally three. In the south as for example in the Bombay

Presidency the carts are relatively smaller being in keeping with the limited tractive power of the somewhat diminutive cattle of those parts. Carts equipped with pneumatic tyres have also begun to appear in recent years but their number is insignificant and mainly confined to the large towns and cities. This type of equipment improves the carrying capacity of the vehicle thus lowering the cost of transport but the heavy initial outlay and dearth of metalled roads in the rural areas have militated against its wider use.

It should be noted that transport by road is preferred for short hauls even where origin and destination are connected by rail as it involves less handling is more expeditious and works out cheaper for distances up to say 30 miles.

(c) *Motor lorry*—Another means of transport which is of increasing importance is the motor lorry. Lorries generally ply on metalled roads but are frequently found to operate on *kachcha* routes between October and May. The number of first class metalled trunk roads in India is comparatively small the two main arterial systems being the Grand Trunk Road from Calcutta to Peshawar and the Trunk Road connecting the north with Bombay and South India. These roads are joined at intervals by subsidiary roads which connect up a number of towns and cities but do no more than touch the fringe of the rural areas. In the transportation of linseed—the main directional movement flows from the producing areas to the ports—motor lorries are used from certain assembling markets to the nearest railway stations particularly when the distances are considerable e.g. from Hanumana market in Rewah State to Mirzapur station a distance of 42 miles. For the transport of linseed from the docks or rail termini to the mills motor lorries are also in general use at Calcutta and Bombay and at interior crushing centres such as Cawnpore and Nagpur. Lorries compete seriously with the railway at many points. Owing to the large number of relatively low schedule and special rates provided by the railway no instances were observed in the course of the survey of linseed being carried by motor lorry between two points connected by rail but linseed oil is frequently sent by lorry for example from Calcutta to Burdwan—a distance of 67 miles. This means of transport is in such cases preferred not only because the cost is less than the equivalent charge by rail but also because handling and cartage to and from the stations are eliminated so that even if the rates quoted happened to be the same the economies resulting from reduced handling would favour the lorry. Another factor in favour of the lorry is the saving in time and the freedom from formalities attendant on hooking or clearing goods at the railway stations. In some instances the lorries accept rates considerably lower than the railway freight but it is not known whether such rates are economically sound. For example one Cawnpore mill arranged to consign linseed oil to Delhi by lorry at Re 0 10 0 per maund whereas the railway freight at the time between these two points was Re 0 14 6.

*A through route is now under construction from Calcutta to Bombay. This new highway will link up a number of the existing roads in the provinces through which it will pass.

Lorries (and bullock carts) are mostly owned by individuals and not by corporate bodies although certain owners have more than one vehicle. In the large towns and ports however a number of transport contractors own and operate fleets of lorries as well as carts. In this connection it may be interesting to describe conditions in Calcutta which as far as can be ascertained are not typical of conditions in Bombay or other cities and large towns. The right to carry all goods from certain points of arrival such as railway stations, riverside ghats, etc. has gradually come to be acquired by contractors known locally as *chaudhari**. This right has no legal sanction but is apparently based on long usage and seems to be generally respected by the other competing carriers. Each *chaudhari* therefore has his own particular centres and excludes other contractors from operating from the same localities. This arrangement is not officially recognised by the railway and other transport companies which incidentally do not exercise any control over outside carriers so that virtually speaking each contractor holds a quasi monopolistic position in regard to the terminal served by him. As a result the rates of cartage tend to be higher from points where the *chaudhari* system is in vogue as for example at the Howrah Goods Depot whence the rates are comparatively dearer than from Kantapurer at the Kidderpore Docks which is a free point worked by a number of competing contractors.

(d) *Cost of conveyance*—The cost of conveyance by road varies according to the condition of the road, the time of the year, the distance and the chances of a return load. The charges for carriage are less on metalled roads than on *kachcha* roads and are generally lowest in the winter when dry weather prevails and highest in the monsoon when the rain impedes movement. Short hauls are dearer than long distance transport.

In the United Provinces, Bihar and Bengal the charges by bullock cart range from about 2 pies to 3 pies per maund per mile. On the metalled roads of these areas it costs from Rs. 2 to Rs. 2.80 to carry 20 maunds for 10 miles. This is equivalent to 1.9 to 2.4 pies per maund per mile. Costs are about half as much again on *kachcha* roads. Motor lorries charge comparatively less than bullock carts for longer hauls. For example at Mirzapur the lorry rate for carrying linseed from a distance of 42 miles to railhead was found to be Re. 0.80 per bag of 2½ maunds i.e. about 1 pie per maund per mile.

In the Central Provinces the average cost of transport on metalled roads is estimated to be about 1.2 pies per maund per mile while the rate for *kachcha* roads stands at 2.66 pies per maund per mile. In the Bombay Presidency carriage by road may be reckoned as 2 pies per maund per mile in the villages and double that figure in the cities. In Hyderabad it is approximately 1.6 pies per maund per mile while at the ports of Calcutta and Bombay the average rate is as high as 5 pies per mile.

It is almost impossible to calculate an accurate average rate for the whole of the country owing to the variable conditions in the provinces and States but it may be stated in a very general way that

*The term is an honorific title meaning important one.

the transport of linseed by road costs on an average roughly 2 pias per maund per mile

On occasions when unfordable rivers have to be crossed during the monsoon the carts have to be ferried over from one bank of the river to the other. These charges amount variously to Re 0.80 to Re 1 per cart according to season and the width of the river. Frequently tolls have also to be paid by all types of vehicular traffic for crossing over bridges particularly in North Bihar.

(2) BY RAIL

The great bulk of linseed is moved by rail. Taking an average for the triennium ending March 1937 the inter provincial traffic by rail amounted to over 247 000 tons carried mainly from the United Provinces Bihar the Central Provinces and Hyderabad to the ports of Calcutta and Bombay. This takes no account of the movement within the provinces and States which having regard to some 16 000 tons of linseed railed from stations in the Bengal and Bombay Presidencies to Calcutta and Bombay and the quantities used at the more important upcountry milling centres may be reckoned to amount to about 38 000 tons. Thus a total of some 285 000 tons were on an average put annually on rail. This represents about 60 per cent of the average annual crop of those years.

Exports and imports of linseed by rail (and river) relating to the different areas are given in detail in Appendix XII.

Comparison with 1919-20 shows that the average provincial and State imports and exports during the years 1934-35 to 1936-37 have not very greatly changed as regards their general relationship although the total quantities moved in the latter period are about 20 per cent in excess of 1919-20. As regards imports the most significant change is seen in Bombay meanings in that presidency having almost doubled from nearly 62 000 tons to well over 112 000 tons. Imports into Bombay during 1919-20 are perhaps not a fair index of the volume of traffic as there was a serious crop failure in 1918-19 which largely affected the trade of Bombay. On the other hand Bengal's imports from other provinces mainly for export have declined by about 9 per cent from about 133 000 tons to 122 000 tons. The Central Provinces now import less than formerly while Madras on the other hand imports a good deal more. In both cases the quantities involved are small. In the former area imports have dropped from about 5 600 to 1 100 tons and in the latter imports have increased from less than 100 tons to 7 600 tons. This is accounted for by the fact that linseed is now being consigned to Vizagapatam for shipment abroad this port having been opened in 1933-34. Imports into Sind mostly to Karachi have diminished from about 7 600 tons to less than 100 tons. Supplies used formerly to be consigned from the United Provinces to Karachi but owing partly to adjustment of railway freights the export trade which formerly went through Karachi has been largely diverted to Bombay which lies somewhat nearer to the producing centres.

As regards exports Bihar now despatches about 18 per cent less than formerly the quantities involved having fallen from about

91 000 tons to a little more than 75,000 tons. This is due to increased consumption by oil mills within the province. Exports from Central India and the Central Provinces have risen from about 19 000 tons to 24 000 tons in the first named area and from some 13 000 tons to over 22 000 tons in the latter. The increased local production of linseed which is indicated largely accounts for the greatly reduced imports into the Central Provinces. Hyderabad now sends out of the State much larger quantities than formerly exports amounting to nearly 42 000 tons as against 18 000 tons in 1919 20 reflecting an expansion of production. Rajpntana also exports on an increased scale the traffic having risen from about 6 000 tons to over 13 000 tons. The United Provinces exported about 20 per cent more in 1934 35 to 1936 37 than in 1919 20 the figures being approximately 69 000 tons and 56 000 tons respectively.

(a) *Railway freight*—The rates of freight charged by railways fall into 3 divisions viz

- (i) class rates
- (ii) schedule rates and
- (iii) station to station rates

(i) *Class rates*—The different commodities are grouped into classes for the purpose of arriving at a rate where schedule or station to station rates do not apply. Minimum and maximum rates are fixed for each class. All rates of whatever kind must be kept within these limits. The maximum of the class in which a commodity is placed is the ordinary rate per maund per mile.

The sixteen classes in which commodities are now divided (as from May 1936) with the maximum and minimum rates as fixed by the Railway Board are as under —

Class	Maximum per maund per mile (pies)	Minimum per maund per mile (pies)
1	38	100
2	42	
2A	46	
2B	50	
2C	54	
3	58	166
4	62	
4A	67	
4B	72	
5	77	
6	83	
6A	89	
7	96	
8	1 04	
9	1 25	
10	1 87	

In common with other agricultural staples linseed is placed in class 1 and unless schedule or station to station rates are applied on any particular railway system or between any two stations the ordinary rate for linseed is at 38 pie per maund per mile. Various

additions are made to class rates for terminals short distance charges and tolls

(n) *Schedule rates*—A schedule rate is a rate quoted on a basis lower than the maximum of the class. It may be on a uniform basis, such as 250 pie per maund per mile or it may vary according to distance or weight on the telescopic (cumulative) principle. A schedule rate may be quoted per maund, per ton or per wagon. Schedule rates applicable to linseed vary considerably over different railway administrations, e.g., the schedule rate for linseed over the Bengal and North Western Railway is 250 pie per maund per mile for distances of 100 miles and over, while on East Indian Railway it is 333 pie per maund per mile for distances less than 101 miles and on the following telescopic scale for distances 101 miles and over

For the first 75 miles	380 pie per maund per mile
From 76 to 300 miles, add at	200 pie per maund per mile
Above 300 miles add at	100 pie per maund per mile

(m) *Station to station rates*—A station to station rate is a special rate for the total distance between two specific points.

These are fixed on the principle 'what the traffic will bear', and represent special reduced rates between two points fixed on a consideration of the volume of traffic and in order to meet competition from other transport agencies be they railways, lorries, country craft or steamers. Station to station rates have been granted from a number of stations in the United Provinces Bihar and the Central Provinces which despatch considerable quantities of linseed to Calcutta, Bombay and Vizagapatam.

The following table gives a few specimen station to station rates and for comparison the rates calculated on class and schedule basis (with additions for terminals etc., where applicable) —

Specimen rates of freight on Linseed (per maund)

From	To	Railway	Distance (miles)	Station to station rate	Calculated at schedule rates	Calculated at class rates
				Rs a p	Rs a p	Rs a p
Basti (U P)	Howrah (Calcutta)	B N W E I	248			
			261	0 8 10	0 12 10	1 2 7
			—529			
Dighwara (Bihar)	Howrah (Calcutta)	B N W E I	78			
			283	0 6 5	0 7 6	0 11 5
			—361			
Raipur (C P)	Bombay	B N G I P	190			
			518	0 14 1	1 3 3	1 7 9
			—708			
Nagpur (C P)	Bombay	G I P	520	0 8 5	0 13 3	1 1 10

(b) *Terms of booking*—When linseed is packed in new sound bags it is accepted by railways for carriage at railway risk, but when

in the opinion of the station authorities the bags are old or defective, the railways accept such consignments only at Owner's risk

Enquiries in different provinces have shown that the major portion of the consignments tendered for carriage to the ports, are packed in new or sound once used gunnies and are accordingly accepted at railway risk. Over the Bengal Nagpur and Eastern Bengal Railways lower freight rates are allowed for booking at owner's risk and consignments in old bags can also be booked at owner's risk.

Before the goods are loaded into the wagons 10 per cent of the consignment are generally required to be weighed and marked. In practice however a smaller number which amounts in most instances to 5 or 6 bags only, irrespective of the size of consignment is weighed if the weights are found to be uniform.

Linseed is invariably carried in covered wagons. On the metre gauge systems the capacity of a wagon may range from 9 to 11 tons. On the broad gauge lines the wagons carry from 14 to 24 tons. As a rule the supply of empties available is ample but some complaints were made by the trade in the United Provinces and Bihar as to the delay in obtaining the wagons, particularly at the smaller stations during the months of May and June when the pressure of the crop is at its height.

For outward traffic, wharfage is levied on all goods brought to the railway sheds but not booked up to midnight of the day next following that on which goods are brought to station and for inward traffic on goods not removed from railway premises within the free time allowed, which is usually 48 hours after midnight of the day on which consignments are made available for delivery. Demurrage is charged on vehicles ordered and waiting to be loaded by consignors or unloaded by consignees after expiry of free time allowed which is usually nine hours of daylight from the time at which the vehicles are placed in position for loading or unloading. The charges for demurrage are levied generally on the basis of the carrying capacity in tons of the wagons used and the wharfage charges are calculated on the basis of the actual weight of the consignment. The rates for demurrage vary on different railways. For instance, demurrage charges on the B B & C I G I P, and N W Railways are one anna per ton or part of a ton of the carrying capacity of the wagon per hour or part of an hour, whereas on the E I Railway the charge is 8 pies per ton or part of a ton. Wharfage on the other hand, is levied generally at the rate of approximately 3 pies per maund per day. The object of these charges is to discourage consignors and consignees from using railway wagons or sheds as a public warehouse for their convenience.

Over and above the authorised charges the trade has to meet certain miscellaneous expenses to obtain facilities in booking and clearing of consignments. These charges are included in the invoices exchanged between merchants.

(3) BY RIVER

Transport by water is generally cheaper than transport by either road or rail and is availed of wherever possible. Its main disadvantage is that it is much slower, particularly where country sailing craft are engaged. Transport by this means is confined to the United Provinces, Assam, Bihar and Bengal.

Rates of freight are highly variable and are subject to negotiation, and in this respect have much in common with road traffic, the cost of which is also open to bargaining.

The quantities of linseed carried by the river steamers are recorded, for some stations by the Department of Commercial Intelligence and Statistics and included in the rail and river borne statistics published monthly, but no records exist of traffic by country boats. A very rough estimation, however, based on personal observation at a number of river side points would appear to indicate that the total volume of linseed carried by country craft in Bihar and United Provinces is somewhere between 2 000 and 3 000 tons.

United Provinces—A considerable amount of internal traffic of which linseed forms but a small proportion amounting to nearly 1 000 tons is carried on the rivers flowing between the districts in the east of the United Provinces and Bihar. A number of these rivers the Ganges, Jumna, Gogra, etc. are navigable throughout the year over certain distances but during the rainy season long stretches which are ordinarily almost dry or too shallow for navigation become full of water deep enough to permit the passage of heavily laden country sailing craft. During this period it has been observed that the freights charged by country boats are lower than at any other season of the year.

Apart from paying the boatman for the carriage of the produce a charge has to be paid to the ghat contractor for loading and unloading the boats. The latter item varies from 3 pies to 6 pies per bag and the charges for carrying the goods down to the boat or from the boat to the bank range from 0.1 to 0.2 pie per maund per mile according to distance.

Freight by country boat is considerably cheaper than by rail. For example the rate for carrying linseed by boat from Gorakhpur to Sahebganj—a distance of over 200 miles—was ascertained to be Rs. 12.4 0 per 100 maunds or equivalent to about Re. 0.20 per maund as compared with Re. 0.63 per maund by rail.

Bihar—Boat traffic is mainly confined to the Ganges, but a small quantity of linseed also moves along the Sone canals and the rivers in South Bihar which are navigable only in the rainy season and immediate post monsoon months, i.e. between July and October. Linseed is carried from up river chiefly to Patna, Bhagalpur and Sahebganj. The rate from Buxar to Patna—a distance of 73 miles—is Re. 0.36 per bag or approximately 0.13 pie per maund per mile. The toll charges on canals and rivers where levied are comparatively small and vary from $\frac{1}{4}$ pie to 2 pies per maund.

Bengal—A proportion of the linseed exported from the markets in the main producing districts to Nahrati and Calcutta (Jugganath Ghat) is carried by country craft. The quantities so transported

form only a small fraction of the total amount of linseed consigned to Calcutta from various sources for, apart from the time factor and other risks, the produce sent by rail can be more conveniently booked direct to mill sidings, to Kantapuker or alongside the steamer at Kidderpore Docks

Boat hire from Cbuadanga to Calcutta—a distance of 84 miles—amounts to Re 0 1 6 per maund or 21 pie per maund per mile

At Calcutta boats and barges plying on the river Hooghly occasionally carry linseed products to the vessels lying in the docks or outside in the stream, but as a rule the loading and discharge of linseed are effected alongside the wharves

Assam—Two typical boat hire charges are those from Silchar to Karimganj, a distance of 35 miles and from Gachbari to Sylhet, 30 miles. The rate for the former is Re 0 1 6 per maund and for the latter Re 0 1 0 per maund. The charges thus approximate 4 to 5 pie per maund per mile

Most of the country craft (see the plate facing page 176) used on the Ganges Brabmaputra and other waterways in the United Provinces, Bihar and Assam are small and have capacities ranging from 50 to 500 mannds. They are mainly used over comparatively short distances only and are owned either by the boatmen themselves or, in a few instances by merchants

The insurance of goods so consigned is apparently considered an unnecessary luxury by the local trade

A small part of the river traffic in linseed in the above mentioned provinces is also carried in "flats" towed by the steamers one of which may be seen in the foreground of the plate opposite page 163 lying alongside a pontoon jetty near the Howrah Bridge at Calcutta. River steamer freights although lower than those charged by the railways, are somewhat dearer than country boat rates. For example, the special freight rates from Dighwara to Calcutta, a distance of about 361 miles are Re 0 4 0 and Re 0 6 5 per maund by steamer and railway respectively. During 1936/37, the amount of linseed received in Calcutta by river steamers was about 4 000 tons and represented 3 per cent of the total arrivals

(4) BY SEA

(a) *Coastal trade*—The coastal trade in linseed between the different ports of India is insignificant. Consignments of a few bags at a time are periodically shipped from Calcutta to Rangoon and from Bombay to Malabar coast ports but the quantities involved are in small retail lots and of no importance

(b) *Foreign trade*—The foreign trade in linseed has already been referred to in Chapter I. The produce may either be shipped in what is known as parcels, i.e., lots of a few hundred tons at a time or in full cargoes in which case the entire capacity of the vessel is chartered. Parcel freights on the regular steamship services which operate between India and the United Kingdom Continental Europe and America are booked at the port of shipment usually through freight brokers. On the other hand when full cargoes are involved

the vessels are normally chartered in London, on the Baltic Exchange, freight being payable, usually in sterling, at destination after discharge

The rate of sea freight plays a significant part in the linseed export trade as it forms the largest single item in the price spread between the producing and consuming countries. Freight rates often vary from month to month according to the supply and demand and there are also differences between the rates for ready or near shipments and those for more distant positions. These conditions obtain at Bombay which is a free market for freights to foreign ports, and at some of the other major Indian ports. At Calcutta however the rates of freight are determined periodically by a Conference of all the shipping lines. Such Conference rates of freight as are fixed from time to time by the representatives of the steamer companies, with the previous sanction of their principals in the United Kingdom or else where, apply to all the companies. A rebate of 10 per cent. is granted to exporters provided all their shipments have been made by Conference vessels and not by any outside tonnage. For this reason sea freights from Calcutta are more stable than if this port were a free market but are on the other hand, considerably dearer than Bombay

The differences are particularly marked in the years prior to 1936-37 and it is probable that Calcutta linseed would have found an even larger market had the rates of freight from that port been on a more competitive basis

It should be noted that the basic rates of freight from Calcutta to the United Kingdom are fixed on a range of major ports embracing London, Liverpool, Glasgow, Dundee and Manchester. The rates quoted for these ports apply to any quantity whatever. For the minor ports such as Lenth, Hull, Southampton, Avonmouth, etc. the rates are higher by 5s per ton for parcels varying between a minimum of 300 tons to 500 tons 2s 3d per ton for 500 tons to 1 000 tons and 1s 3d for 1 000 tons and above

The following table shows the comparative rates of freight for linseed from Bombay and Calcutta to London

Sea freights on Linseed to London

(Shillings per ton)

	Bombay to London.			Calcutta to London (subject to 10% rebate)		
	Maximum	Minimum	Average	Maximum	Minimum	Average
1932-33	21	13	17/6	33/9	27/6	28/2
1933-34	21	15	17/6	27/6	27/6	27/6
1934-35	18	15	16	28/9	28/9	28/9
1935-36	20	13	17/4	28/9	28/9	28/9
1936-37	37	15	21/9	32/6	28/9	29/8
1937-38 (9 months)	42	27	34/4	47/6	32/6	38/8

INTER CHAPTER EIGHT

Linseed is generally handled in bulk by the cultivator, but on being taken to the market it is bagged usually in B Twill or Heavy C Gunnies. It should be noted that the prices quoted upcountry are exclusive of bags but at the ports the price includes bags.

One outstanding feature seems to be the constant cleaning and the re cleaning of the linseed at every stage. It seems obvious that when it is first cleaned upcountry the amount of impurities could be reduced well below 3 per cent without any extra cost, but as already mentioned the buyers' contracts at the ports are based on a higher figure and there is, therefore, no incentive to clean the seed properly so that dirt is shipped forward and extra freight paid on it. The extra freight is estimated to amount to 2 lakhs rupees and along with the cleaning costs the total loss amounts to over 3 lakhs on the linseed shipped to Calcutta alone.

Another point which is worth noting is that after leaving the cultivator the linseed is not handled in bulk, but in recent years exports from Bombay to the United States have been bulked at the time of shipment and this method shows a saving of Rs 2 to Rs 3 per ton in sea freight.

Freight forms a very big item in the total costs of distribution. During the course of the survey no instance was observed of linseed being carried by motor lorry between any two points joined by rail. This is probably due to the fact that in the case of linseed the railways quote a very large number of station to station rates and also schedule rates which are lower than the class rates. Road transport apparently costs about one pie per maund per mile and probably on an average about two pies and ranges higher in the cities where the

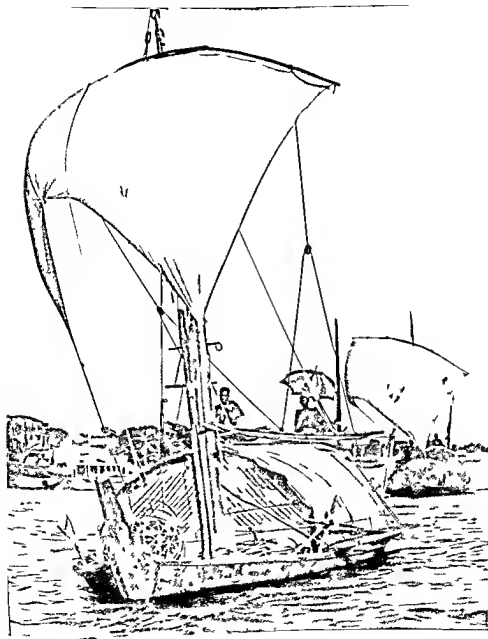
cost is about 5 pies per maund per mile. The railway class rate is 38 pie per maund per mile but some railways have scheduled rates averaging about 25 pie per maund per mile and based on a telescopic scale which goes as low as 1 pie per maund.

River transport, particularly in Bihar, United Provinces and Bengal, where large quantities of linseed are produced, seems to be the main competitor of the railways and the freight by river ranges from about 1 to 2 pie per maund per mile.

The railways, however, handle by far the larger part of the business and it is estimated that at least 60 per cent of the total crop is put on rail. In some parts, however, the available services provided by the railway leave something to be desired. Considering how sensitive linseed is to damage by rain there is an obvious need for the supply of covered accommodation at the railway stations at a number of centres. The use of hooks is also still prevalent. This is particularly objectionable in the case of linseed, and at one of the leading stations the loss in transit on this account alone has been estimated at 1 per cent. These are small but important items.

At the ports, particularly in Calcutta, the *chaudhari* system seems to lead to an undue increase in the handling charges. Calcutta seems also to be handicapped as compared, for example, with Bombay by the higher rate of sea freight to Europe—the difference in some years in the average freight being more than ten shillings per ton.

Country boats plying on the Ganges



CHAPTER IX—WHOLESALE DISTRIBUTION

A—Agencies and methods

The distributive agencies for linseed are much the same as for wheat and have been discussed in detail in the Report on the Marketing of Wheat in India. The only difference is that wheat being a food crop entails an extensive retail distributive system whereas the retail trade in linseed is of negligible proportions.

The wholesale distribution of linseed may be undertaken by one or other of the following agencies—(1) Cultivators (2) Village merchants (3) Commission agents—*arlatijas* (*kachela* and *pakka*) and wholesale merchants (4) Co-operative organisations (5) Exporters and (6) Oil mills. The diagram opposite this page shows the various channels through which the linseed crop moves from the producer to the consumer in India and for export as well as the approximate extent of participation of the different agencies concerned.

(1) CULTIVATORS

As a rule cultivators do not take a prominent part in the whole sale distribution of this crop. Their activities are confined to the localities in which they live and mainly concern the distribution of linseed to owners or operators of village *ghanis*. Such sales take place usually at the *hats* or in the villages. In village sales when cash is not involved the linseed is bartered for the oil. The two common methods of exchange are for the *teli* (oil miller) to give to the cultivator the oil obtained after crushing the linseed brought to him by the latter retaining the cake as his charge or fee for crushing or alternatively to hand over oil equivalent to 18 to 22 per cent of the weight of linseed received by him. It is estimated that approximately 25 per cent of the total quantities of linseed crushed by village *ghanis* i.e. between 16 000 and 17 000 tons is supplied by the growers either direct or through sales in the village *hats*. Reckoning an additional 3 000 or 4 000 tons distributed by them for domestic consumption in the villages the quantities of linseed distributed annually by producers appear to be about 20 000 tons or between 4 and 5 per cent of the average crop. This of course is in addition to the 26 000 tons which are required annually for seed.

(2) VILLAGE MERCHANTS

Supplies of linseed acquired by village merchants directly from producers or in the open market are largely sold for crushing in the country *ghanis*. Sales are also made for domestic consumption and to a small extent for seed for sowing. Enquiries have shown that about 50 per cent of the total requirements of the village *ghanis* equivalent roughly to some 33 000 tons are obtained through these channels.

The total quantities distributed by village merchants apart from the quantities taken by them to the assembling markets would

appear to fall not far short of 48 000 tons or 10 per cent of the average production.

(3) COMMISSION AGENTS (*arhatiyas*—*lachcha* AND *palka*) AND WHOLESALE MERCHANTS.

The *arhatiya* (commission agent) constitutes the main link in the marketing chain of linseed. The *lachcha arhatiya*, acting on behalf of the seller who may be a cultivator, village merchant or any other type of person, arranges the change of ownership at the assembling market and thereafter does not figure in the subsequent distribution of linseed except on the comparatively infrequent occasions when he assumes the role of a wholesale merchant or stockist. When this happens, the *lachcha arhatiya* does not ordinarily have the produce brought to him by his client for commission sale but procures his supplies from other *arhatiyas* of his kind.

The *palka arhatiya* who may be regarded as the wholesale merchant or stockist proper effects purchases of produce from or through the *lachcha arhatiya* in the assembling market. The goods are then stored and sold direct to consumers such as mills or exporters or consigned to distant markets and sold there through other *palka arhatiyas*. In addition to trading on his own account the *palka arhatiya* also functions as a commission agent for the sale of produce belonging to others. A large number of *palka arhatiyas* are firms of some standing and substance and often command financial facilities of no mean order. They operate usually as a partnership of two or more persons. Business relations are maintained with other *arhatiyas* in a number of markets while in many instances large concerns have their own branches all over the country.

The *arhatiyas* established at the ports and other large consuming markets keep their upcountry clients regularly informed of local market conditions so that if the indications warrant, the latter may forward consignments to them for commission sale. Such consignments may be despatched either against previous sales or on account in which case the necessary instructions as to eventual disposal are furnished later. When a firm of *palka arhatiyas* has branches in other markets purchases of produce are effected through these branches.

Conversely *palka arhatiyas* in the assembling markets keep the port *arhatiyas* informed as to the quantities of linseed available and the price limits at which they would like to sell and on the basis of these advices the latter make ready or forward sales to exporters and mills.

Small samples are usually exchanged between these traders at the beginning of the season in order that the qualities available may be appraised.

(4) CO-OPERATIVE ORGANISATIONS.

The amount of linseed distributed by co-operative organisations is negligible. The commission shops in the Punjab do not handle

linseed while sales by the few Co-operative Sale Societies functioning in Bombay, as already mentioned, do not exceed 25 tons annually. No instances were observed in any of the other provinces in which the co-operative movement participated in the distribution of the crop.

(5) EXPORTERS

A large proportion of the export trade in linseed is at present in the hands of two international firms of produce merchants whose operations are controlled from Europe, usually from London. There are however a number of Indian firms at Calcutta and Bombay whose share of the export trade in linseed although still small has increased in recent years. Formerly these international concerns maintained a widespread buying organization upcountry consisting of a number of agencies situated at important commercial centres which in their turn administered a large number of sub-agencies staffed with the exporters' own personnel. These agencies were employed in the purchase of agricultural commodities including linseed, frequently, from the producer direct and in the sale of imported articles such as piecegoods. An alternative method of making purchases through "guarantee" brokers working on the lines of *arhatiyas* was not fully exploited until after about 1931 when the depression coupled with diminishing exports of many agricultural commodities, compelled the closing down of a large number of upcountry branches. These "guarantee" brokers are commission agents of repute who have their own organisations at various centres. In consideration of a pre-arranged rate of commission, these concerns guarantee the due fulfilment of all contracts entered into by them on behalf of their principals with whom they are required to maintain a security deposit in the form of a substantial sum in cash on which interest is paid usually at 1 per cent above the Bank rate.

With the improvement in economic conditions during the past year or two, a tendency towards expansion has been noticed and exporters have reopened some of their branches in a number of markets in producing areas and have appointed *arhatiyas* in others to make purchases on their behalf. Some of these agencies are open throughout the year while others are seasonal operating only during the six months or so following the harvest.

The methods of effecting purchases of agricultural produce by exporters are on "port pass", "agency pass" and "ready" terms. Purchases on "port pass" and "agency pass" terms which are fairly common in the wheat trade are not in vogue as far as the linseed trade is concerned and most of the linseed purchased is either on "ready terms"† or for delivery within a month.

"Port pass"—Payment to be made according to weight and analysis as found by exporters at the ports.

† "Agency pass"—Payment to be made according to weight and analysis as found at the exporter's agency upcountry.

‡ "Ready"—Goods which are immediately available, or the railway receipts for which are held by sellers.

Such purchases at the ports are devoid of risk as they are regulated by contracts the liquidation of which takes place only after the goods have been analysed (A copy of a typical exporter's contract is given in Appendix XXXVII) Upcountry purchases on "ready" terms which are often made on visual examination only imply a great deal of skill on the part of the buying agent or brokers as any under estimation of refraction on their part, as shown between upcountry valuations and port analysis would result in a dead loss as the goods would have been paid for on the basis of the under estimated impurity content. Shortage between the weights paid for upcountry and those subsequently delivered at the port would also cause loss. This method of purchase therefore necessitates strict and constant supervision by the firm's officers who are located at convenient centres and part of whose duties are to check the actual costs of such purchases by analysis and comparison with the prices advised to headquarters.

The price limits to buy are telegraphed to their agencies by the exporters' head offices at Calcutta and Bombay. These limits are usually of short duration and are often valid for a few hours only particularly when the market is fluctuating rapidly. Rarely are buying limits left in force for more than one day. They usually lapse on the evening of the day on which they are received and in certain cases are renewed automatically on the following morning should fresh instructions not have been received overnight or early in the morning. If the limits are practicable purchases are made the quantities bought and the rates being at once advised to headquarters by telegram.

(6) OIL MILLS

The oil mills generally buy their requirements of linseed through *arhatiyas* and wholesale merchants either in the local market for preference or at more distant places. (A copy of a typical contract used by an oil mill for such purchases is reproduced in Appendix XXXIII) Alternatively they may send out representatives to assembling centres in the producing areas as occasion arises to make purchases on their behalf and in a few instances only they may maintain a permanent or semi permanent staff of their own in selected centres. Normally the oil mills do not participate in the trading of linseed though on occasions when it suits them to do so surplus stocks are sold off.

B—Finance of wholesale distribution

This has been described at some length in the Report on the Marketing of Wheat and is essentially the same in respect of both the commodities. The distribution of linseed from the assembling market right up to consumption in India or export abroad is financed at various stages by the *arhatiyas* and wholesale merchants by mills and by shippers. The actual funds are obtained from the modern joint stock banks which maintain branches in all the more important trade centres in the country and from the shroffs who play such a large part in the indigenous banking system in India.

(1) *Arhatiyas* AND WHOLESALE MERCHANTS

These are frequently concerns possessing substantial capital and in addition to trading in commodities, a number of *arhatiyas* also function as baulers or discount houses drawing and discounting *hundis* (drafts and bills of exchange). When necessary short or long term loans are obtained from the banks or from shroffs. It is customary for advances to be made by these firms to the extent of 70 or 80 per cent of the value of the goods sent to them for commission sale. The rate of interest charged on such advances varies with the market the season and the financial status of clients but is generally between 6 and 9 per cent per annum. *Pakka arhatiyas* also make advances to *kachcha arhatiyas* and village merchants (*baniyas* or *beoparis*) the amounts and terms of such advances depending entirely on the credit and business relations existing between the parties concerned.

(2) EXPORTERS AND MILLS

Exporters and large mills at the ports buy linseed from the local *arhatiyas* and wholesale merchants. It is usual to pay 90 per cent of the value of the produce against clean * railway receipts or on arrival of the goods. To finance the purchase of linseed bought at or through their own buying agencies in the interior shippers may remit funds by telegraphic transfer through one or other of the exchange banks or as more frequently happens the upcountry branch sells drafts on its head office or other branches according to the suitability of rates.

Exporters who have their offices in London or at other centres outside India generally provide themselves with funds in India by selling sterling bills of exchange usually drawn at three months sight or telegraphic transfers to such banks at the ports as handle foreign exchange. Another source of funds is from the import trade. Money received in India against sales of imported commodities such as piecegoods is usually re-invested in the country in the purchase of such export commodities as cotton oilseeds grains, etc.

(3) BANKS

There are several classes of banks in India—the commercial banks which are joint stock companies the co-operative banks including the land mortgage banks and the Reserve Bank of India. The last named is the bankers' bank and is entrusted with the cash reserves or fluid resources of all the important banks. It cannot lend to agriculturists direct. The actual financing of the movement and storage of the crops is undertaken mainly by the commercial banks. The agriculturist himself is seldom able to have direct negotiations with the large joint stock banks for the reason that the quantities of produce which any individual grower can dispose of or store are much too small—apart altogether from the question of

*The term "clean" is applied only to railway receipts which are unqualified by the railway administration with such remarks as "bags torn" or "bags wet contents liable to damage" etc.

storage facilities which may be adequate enough for the purpose of domestic conservation but quite unsatisfactory from the bank's point of view. Certain exceptions to this general condition occur notably in the Punjab where there are several large estate holders with considerable quantities of produce mainly wheat and cotton and who also own secure and well built godowns.

In addition therefore to performing all the ordinary banking functions of discounting and buying *kundis* or bills and remitting or receiving money a portion of the average commercial bank's funds are liable to be used seasonally for the purpose of making advances to traders on the security of pledged stocks of grain seeds and other agricultural products. The land mortgage banks as the name implies do not participate in commercial finance or handling of trade documents or railway receipts nor as far as can be ascertained do the other co-operative banking institutions except in special circumstances.

It is interesting to observe that the Statutory Report of the Reserve Bank of India recently issued* has drawn attention to the fact that the extension of the arrangements for the financing of the movement of marketing of crops for which the Bank is in the best possible position can only be undertaken concomitantly with improvements in the grading and standardisation of staples and of contracts with the development of proper storage facilities and the establishment of properly regulated local as well as futures markets.

(4) *Shroffs*

These are the indigenous bankers of the country and to a very large extent finance the internal trade in primary products and internal industries generally. *Shroffs* are usually of the Vaish caste most of them belonging to the *Varuani* and *Sindhi* communities although in Western India a number hail from *Cutch* and *Gujarat*. Their *kothis* or *gaddis* are a feature in all the chief markets throughout India. In *Burma* a community of *Brahmins* known as *Chettijars* from South India fulfil an almost exactly similar function. Firms of *shroffs* often carry on wholesale trade in cotton grain cloth or sugar and work as *arkatiyas*. Others again are bullion merchants as well while a few operate also as jewellers and dealers in precious stones. They advance loans just as the banks do on stocks of produce but the formalities are fewer and much less involved and if the conditions of security are less strict the rate of interest charged is somewhat higher. Loans are also made on promissory notes on personal security. The main

*Published in December 1937

†*Kothi*—house

Gaddi—Literally a mattress. The word however is commonly applied to the place of business of a firm from the fact that it is customary in India for the clerks and accountants employed by Indian business houses to work sitting on the floor on mattresses. Even in a number of European controlled joint stock banking concerns and import and export houses the cashiers and *shroffs* still follow the traditional mode of squatting on the floor on mattresses.

activity of the *shroffs*, however, is the discounting of *hundis* or drafts and bills of exchange

Hundis—These drafts or bills are a cheap and convenient method of transferring money from one place to another and for obtaining credit. There are two kinds of *hundis*, the *darshani* (literally—on presentation) and the *muddati* (literally—for a period), payable, respectively, as their names imply at sight or on presentation, and after a specified period. Bill brokers arrange transactions between buyers and sellers of these drafts the normal brokerage being from 3 to 6 pies per hundred rupees payable by the buyer or by the individual or firm discounting the *hundi*. The discount rates for long term drafts such as *muddati hundis* may be high—as much as Rs 5 per cent in the case of weak or doubtful parties.

Darshani Hundi—The *darshani hundi* is the sight draft of day to day business and may be compared with the “demand draft” of the modern banking system. It is generally payable on presentation but in some markets it is customary to allow a few days of grace. No revenue duty is payable on *darshani hundis*.

Muddati hundi—The *muddati hundi* forms one of the most important instruments of credit handled by the *shroffs*. *Muddati hundis* are generally drawn for anything between 21 and 61 days though they may also be drawn for any other period. Very few of the commercial banks handle this type of paper. These drafts are written on Government stamped paper the stamp duty being Re 01 6 per cent for amounts up to Rs 2 500 and Rs 2 4 0 for every additional Rs 2,500 or part thereof.

The discount rates charged by the joint stock banks ordinarily vary from one to one and a half per cent over the bank rate. On the other hand the *shroffs* have a highly elastic scale adjusted to the status of the drawer. In some cases it may be anything up to 4 per cent higher than the bank rate. Discount is always payable in advance and is deducted by the discounting agency from the amount paid to the drawee or endorser. Again the security offered against these *hundis* is mainly personal and endorsements from persons or firms well known to the discounting house are sometimes insisted on as a kind of guarantee. The inability to honour a *hundi* is considered a very serious event and virtually amounts to insolvency.

From the brief description of the functions of the banks and the *shroffs* which has just been given it will be clear that both financial agencies have common objects but achieve these independently of each other, there being little practical relationship between the two. The spread of modern banking facilities dates from recent years and has not always been available in many important trade centres. The *shroff*, on the other hand is long established and his greater intimacy with his clients renders him better acquainted with their history and position. Accordingly, he is prepared to undertake risks which a bank would not be justified in entertaining with the knowledge at its disposal. The *shroff* therefore remains the main factor in the finance of distribution of the

agricultural commodities Measures are under contemplation by the Reserve Bank to bring the *shroff* within the ambit of the modern banking system and it is considered that the development of an open bill market, in which first class bills could be freely negotiated offers a solution to the problem

(5) REMITTANCES

In practice, only a small portion of the total value of the produce moved from one part of the country to another is required to be actually remitted because of the comparatively balanced nature of the trade in the various commodities When necessary, remittances may be made in a number of ways, for example by means of bank drafts and telegraphic transfers, by cheque, by *hundis* and postal money orders and even by currency notes sent by registered and insured post The last two methods are followed only where small amounts are concerned or in the case of markets where no banking facilities exist

The bank's commission on drafts which varies between 6 pies and Re 0.40 per cent is usually subject to a minimum of Re 0.40 for small sums The rates charged are in inverse proportion to the amount of the draft The average commission on bank drafts—if such an average could be computed—would seem to be about Re 0.20 per cent ($1/8$ per cent)

The *darshani hundi* or sight draft is the most commonly used medium for the adjustment of accounts between traders in different markets *Hundis* may be sold at a premium or discount depending on the local demand for funds The limits of premium and discount on *hundis* between any two places with established banks are determined by the cost of obtaining bank drafts For instance if a bank draft on Calcutta is obtainable at Cawnpore at Re 0.20 per cent ($1/8$ per cent) the premium on Calcutta *hundis* would not ordinarily exceed Re 0.20 per cent for the obvious reason that remittances would otherwise be made through bank drafts Where there are no established banks the limits of premium and discount are wider and may at times be as much as Re 1 per cent The discount rates on *hundis* also vary according to the status of the drawer or endorser *hundis* drawn or endorsed by well known houses being usually discounted on more favourable terms It has been ascertained that the average cost of making remittances by *hundis* is somewhere in the neighbourhood of Re 0.10 ($1/16$ per cent) and is therefore lower than the charges made by banks for drafts

Railway receipts for goods consigned by rail are often sent through a bank or through another party well known to the consignor accompanied by a *darshani hundi* drawn on the consignee The latter is given the railway receipt after duly honouring the draft When there are long established and mutually satisfactory business relations between two firms the railway receipts are sent direct to the consignee If the amounts involved are small the documents may be forwarded by V P P (Value Payable Post)

C—Cost of distribution

Items contributing to distribution costs are the charges for handling and transportation the commissions paid the cost of the bags used and other sundry charges incidental to the movement of the produce from the assembling market to the consumer's premises. These charges vary according to the extent of this movement and the channels through which the produce passes.

When sales are effected directly by producers to consumers for domestic consumption or for crushing in the village *ghanis* or even through village merchants or in the village *kats* the distribution costs are practically negligible.

In cases where there are mills in or near an assembling market for example at Cawnpore or Benares etc. in the United Provinces at Raipur and Nagpur etc. in the Central Provinces and at Patna and Gaya etc. in Bihar the only items constituting the cost of distribution are the cartage and handling charges from the market to the buyers' mill or godowns and when bought from a *pakka arhatiya* the latter's commission and sundry charges. The quantities distributed by producers or bought by the mills directly from the assembling markets however form a very small proportion of the total crop the major part of which moves by rail from the assembling markets a stage further to the ports or other more distant crushing centres.

The distribution costs in the latter instance fall under 3 main items—

- (a) Expenses incurred at the assembling station up to the point where the linseed is put on rail at the station (or ghat if the journey is to be made by boat). These items include charges for cleaning bagging carting to railway station (or ghat) and station expenses (see page 163 Chapter VIII).
- (b) Railway freight (or boat hire) to destination and
- (c) Expenses at destination. These include charges for handling and transportation from station to buyer's godown *arhat* or the *arhatiya's* commission market expenses and octroi and terminal tax etc. where levied.

The expenses under item (a) are paid by the *arhatiya* or whole sale merchant at the despatching station while items (b) and (c) are paid by the consignee or commission agent at destination. The latter deducts the amounts so spent from the eventual sale proceeds of the goods and remits the balance to the consignor after deduction of commission.

Variations in charges at destinations take place not only from market to market but also in the same market as between different *arhatiyas*. It was observed that these variations were not so large and the charges certainly not as numerous as in the assembling

markets At destinations charges are always in cash—there being no deductions in kind

There are two methods of sale at each of the ports of Calcutta and Bombay, and the expenses payable by buyer and seller under the two systems differ At Calcutta they are known as *Teli Kanta** basis and refraction guarantee basis In the former delivery of the goods is taken by the buyer from the seller's godown or from the market, and the charges for weighment are payable by the seller In the latter, delivery is given at the buyer's godown the cost of transport being borne by the seller and weighment charges are paid by the buyer The two systems at Bombay are known as *Bazar Dhara*† (Bazar terms) and *Delivery or Rail Dhara* (Rail terms) In the former delivery is given at seller's godown, brokerage is payable by buyer and the price quotation is based on gross weight including the bags, while railway or delivery terms imply, that the goods are delivered at the buyer's godown, brokerage is payable by seller and the price quoted on the net weight of insured

Many of the *arkhatiyas* in the large markets, particularly at Calcutta and Bombay have printed circulars which they issue to clients giving a statement or *pro forma* of expenses that would be incurred in selling produce through them Below is a translation of one such circular issued by a Calcutta commission agent

Teli Kanta Basis—

	Rs	A	P	
Commission	1	4	0	per cent
Brokerage	0	0	6	per maund
<i>Dharmada</i> (charity)	0	1	0	per cent
<i>Panyrapole</i> (home for cattle)	0	0	6	per cent
Weighment	0	8	0	per 100 maunds
<i>Jalpani</i> ‡	0	4	0	
Stamps (for postage)	0	4	0	per railway receipt
Committee§	0	1	0	
Railway receipt expenses	0	8	0	

The amount of sale will be credited to the client's account 30 days after the date of weighment

*At a first glance the words '*Teli Kanta*' would seem to refer to a system of weighing oilseeds from *Teli* meaning only or pertaining to oil (seeds) and *Kanta* a scale However the words appear to be a corruption of the term '*tale quale*' or '*tel quel*' and imply that the buyer subjects the lot offered to a visual examination and makes his bid on a mental estimation as to its impurity content and general appearance The question of analysis does not arise at any stage in a bargain of this nature

†*Dhara*—literally flow and so by implication the current practice

‡*Jalpan*—denotes 'light refreshment' made up from *Jal* meaning 'water' and *Pani* 'to drink' The term was only met with in Bengal and refers to an allowance paid to the buyer's sample drawer

§Paid to Indian Produce Association Calcutta

Refraction Guarantee Basis—

	Rs	A	P	
Commission	0	12	0	per cent
Brokerage	0	0	6	per maund
<i>Dharmada</i>	0	1	0	per cent
<i>Pinjrapole</i>	0	0	6	per cent
<i>Jalpani</i> and bill making etc	2	0	0	per 5 ton receipt
	3	0	0	per 10 ton receipt
	4	0	0	per 15 ton receipt

The amount will be credited to the client's account 10 days after the day on which part payment is received

The Indian Produce Association Calcutta (see page 199) has fixed the minimum charges which members of the association are entitled to invoice to their clients but there is no bar to members charging a higher scale than the minimum fixed by the association. The minimum authorised charges are as follows the *arhatiya* being required to credit his client with the sale proceeds of the produce 30 days after weighing in the case of *Teli Kanta* basis and 10 days after receiving part payment from the buyer in refraction guarantee " sales

	<i>Teli Kanta</i> basis	Refraction Guarantee basis
	Rs A P	Rs A P
Commission	1 4 0 per cent	0 12 0 per cent
Brokerage	0 0 6 per maund	0 0 6 per maund
<i>Dharmada</i>	0 1 0 per cent	0 1 0 per cent
<i>Go sahala</i>	0 0 3 per cent	
Weighment	0 2 0 per cent	
<i>Jalpani</i>	0 4 0 per 100 maunds	0 5 0 per ton

The various charges referred to in the preceding pages and the difference in distribution costs in a few individual cases may be illustrated by one or two examples

Below is a statement of expenses incurred by an oil mill at Nagpur on 105 bags of linseed brought from an *arhatiya* or commission agent at Pipariya (Central Provinces) —

	Rs	A.	P.
Cost of 232 maunds 1 seer linseed nett @ Rs 4-7 0 per maund	1 029	9	9
Cleaning @ Re 1 per 100 bags	1	0	9
Weighing @ Rs 1 8 0 per 100 bags	1	9	3
Cost of bags @ Rs 22-12-0 per 100 bags	23	14	3
Twine @ Re 1 per 100 bags	1	0	9
Commission @ Re 0 12 0 per cent	7	11	6
Dharmada @ Re 0 1 0 per cent	0	10	6
Carting to station at Pipariya @ Re 0 0 6 per bag	3	4	6
Station expenses at Pipariya	2	0	0
Hundi charges @ Re 0 2 0 per cent	1	5	0
Railway freight @ Re 0 7 8 per maund on 235 maunds gross	112	10	0
Terminal Tax at Nagpur @ Re 0 0 3 per maund	3	10	0
Station Broker (<i>dalal</i>) at Nagpur	0	4	0
Cartage at Nagpur @ Re 0 0 9 per bag	4	14	9
Total	1 193	9	0

The total distribution costs between Pipariya market and the Nagpur oil mill thus amounted to Rs 163 15 3 or 15 9 per cent of the value of the produce at Pipariya. The price delivered at the Nagpur mill was made as follows —(a) cost of linseed at Pipariya 86 3 per cent (b) railway freight 9 4 per cent and (c) other expenses 4 3 per cent.

Below is quoted another instance giving the expenses incurred on a consignment of 10 tons (120 bags) linseed despatched by a wholesale merchant at Uskabazar (United Provinces) to Calcutta for commission sale and eventually sold there to an exporter.

(a) *Expenses at Uskabazar—*

	Rs	A	P	Rs	A	P
Cost of 120 bags @ Rs 25 per 100 bags	30	0	0			
Sewing charges and cartage to Uskabazar station @ Re 0 0 6 per bag	3	12	0			
				33	12	0

(b) *Railway freight from Uskabazar to Calcutta—*

Railway freight @ Re 0 8 11 per md	150	8	0
------------------------------------	-----	---	---

(c) *Expenses at Calcutta*

Deductions made by buyer—

<i>Jalpani</i> @ Re 0 5 0 per ton ..	3	2	0
Demurrage* ..	8	2	0
Brokerage @ Re 0 0-6 per maund	8	6	6
Excess refraction found by buyer after analysis over and above the 5 per cent free tolerance equivalent in weight to 6 mds 18 srs @ the contract price of Rs 5-4 6 per maund	34	1	6
	53	12	0

Deduction made by the *pakka arhatiya* at Calcutta—

Commission @ Re 0 12 0 per cent	10	10	6
<i>Dharmada</i> @ Re 0 1 0 per cent	0	14	3
<i>Pinjrapole</i> @ Re 0 0 3 per cent	0	3	6
<i>Kali Mat†</i> @ Re 0 1 0 per railway receipt	0	1	0
Committee @ Re 0 1 0 per railway receipt	0	1	0
Stamps (postage fees)	0	4	0
	12	2	3
Total	250	2	3

*Rent levied according to the Port Commissioners' scale of charges for the period the consignment was lying in the Kantapukur general sheds (see page 147)

†*Kali Mat*—'Mother Kali'. A charge levied for the purpose of making offerings to the Goddess Kali whose temple at Calcutta is well known not only throughout India but to many visitors from all over the world

The consignment weighed 269 maunds net and was sold @ Rs 5 4-6 per maund for Rs 1 420 10 6 which was shared by different agencies as detailed below —

	Rs	A	P
Price of 269 maunds of linseed at Calcutta @ Rs 5 4 6 per maund	1 420	10	6
Deduction by buyer for refraction in excess of the 5 per cent free tolerance allowed at Calcutta	34	1	6
Price of the consignment at Calcutta on the customary refraction basis	1 386	9	0
Other deductions made by the buyer at Calcutta	19	10	6
Amount actually received by the commission agent at Calcutta from the buyer	1 366	14	6
Deductions made by the commission agent and debited to the upcountry client	12	2	3
Price for Calcutta	1 354	12	3
Deduct railway freight	150	8	0
Price for Uskahazar	1 204	4	3
Cost of bags and other expenses at Uskahazar	33	19	0
Net price* obtained by the consignor at Uskahazar market	1 170	8	3

The distribution costs including Rs 34 1 6 the allowance for excess refraction amounted in this case to Rs 250 9 3 or 213 per cent of the value of the lot. Excluding the said allowance the costs worked out to 184 per cent of the value of linseed at the point of assembling.

The price paid by the exporter at Calcutta for this consignment was made up as follows (a) cost at assembling market 82 4 per cent (?) railway freight 10 5 per cent and (c) other charges 71 per cent.

The costs of distribution between a number of other markets are given in Appendix XLIII from which it will be seen that they may vary from a few annas to over a rupee per maund. Obviously such costs must increase according to the number of times the commodity changes hands before it reaches the final consumer or is exported. Apart from the charges for transportation and handling other items such as commission, brokerage and charity are invariably paid every time the ownership of the goods changes.

*This is not the equivalent of the price eventually obtained by the producer. A number of other deductions on account of assembling charges have to be taken into account (see Chapter V).

The largest variable factor in the distribution costs is railway freight which not only varies according to distance but also as to whether any special freight rate is allowed between two particular points

On the whole it would appear that distribution costs are not unduly high although such items as deductions for charities (*dhamada*) municipal taxes (octroi and terminal tax) and station expenses seem to require consideration. The first two items have already been referred to in Chapter V. As regards station expenses these comprise extra payments and miscellaneous expenses that have to be incurred at the two ends of the railway journey. These charges are debited to the consignors and eventually are indirectly realised from the primary producer who receives a lower price in consequence. They are seemingly small when regarded individually but in the aggregate a very conservative estimate would place them little short of Rs 1 lakh each season for linseed alone.

D.—Total assembling and distribution costs—the price spread from consumer to producer

The total assembling and distribution costs incurred from producer to consumer can best be illustrated by a concrete instance. The following is an analysis of the actual expenses incurred on a consignment of linseed sent by a Gonda (United Provinces) merchant obtained through the courtesy of a Calcutta firm of *arhatiyas*. The market charges at Gonda have been based on enquiries made in Bargaon market at Gonda.

	Rs	A	P
Value of 120 bags containing 269 maunds 16 seers linseed paid by buyer at Calcutta @ Rs 4 10 3 per maund	1 250	3	0
<i>Deductions made by the buyer—</i>			
Refraction in excess of 5 per cent equivalent to 1 maund 26 seers 13 chs	Rs	A	P
	7	12	0
<i>Jalpani</i> Rs 7 and <i>cashery</i> * Rs 2—Rs 9 per 100 tons	0	14	6
Drawing up of the bill Re 0 2 0 and <i>britty</i> † Re 0 0 3 per bill	0	2	3
Demurrage (on 10 tons for 1 week @ Re 0 3 0 per ton per week)	1	14	0
Brokerage @ 15/16 of Re 0 0 6 per maund	7	13	6
		18	8 3
Amount actually received by the <i>pakka arhatiya</i> at Calcutta	1 231	10	9

* *Cashery*—A hybrid term signifying pertaining to the cashier and hence an allowance or remuneration for work involved in making payments

† *Britty*—A retaining fee or allowance

	Rs	A	P
Brought forward	1	231	10 9
<i>Deductions made by the pakka arhatiya at Calcutta—</i>			
	Rs	A	P
Commission	9	5	6
Brokerage	0	9	0
Dharmada	0	12	6
Pingrapole	0	6	3
Railway receipt expenses	1	15	3
Committee	0	1	0
			<hr/> 13 1 6
Amount due by the <i>pakka arhatiya</i> at Calcutta to his client at Gonda			1 218 9 3
<i>Deduct—</i>			
Remittance charge (<i>hundi</i> discount)	0	12	3
Railway freight from Gonda to Calcutta	143	10	0
			<hr/> 144 6 3
Amount actually received from Calcutta by the merchant at Gonda			1 074 3 0
<i>Expenses incurred by the Gonda merchant in despatching linseed to Calcutta—</i>			
Cleaning	3	12	0
Cost of B Twill bags @ Rs 24 per hundred	28	12	9
Twine	0	9	6
Cartage to Gonda station @ Re 0 0 4½ per bag	2	13	0
Station expenses	2	0	0
			<hr/> 37 15 3
Net amount received by the Gonda merchant			1 036 3 9

This is equivalent to Rs 3 13 6 per maund or about Re 0-12-9 per maund less than the Calcutta price. Enquiries at Gonda however show that the merchants there reckon to buy at an average

difference between Calcutta and the local price of about Re 0 14 0 per maund. For all practical purposes therefore the buying price of the Gonda merchant may be taken as Rs 3 12 3 in this instance

Price paid by the Gonda merchant @ Rs 3 12 3 per maund assuming the weight delivered and paid for at Calcutta to be the same as the weight purchased and despatched from Gonda	Rs A P
	1 014 7 3

Charges levied on the merchant at Gonda—	Mds Seers
--	-------------

Zamindari and Chaudhari ¹ @ 3½ seers per cart	}	
Tulari ² @ 3 seers per cart		
Palledari ³ @ 3 seers per cart		5 21
Sundry charities @ 2½ seers per cart		
Bhandari kahari, ⁴ etc @ 1 seer per cart	}	
Gaddi Kharch ⁵ @ 1 seer per maund		13 20
Dhalta ⁶ @ 1 seer per maund	}	
Total deductions in kind		19 1
		Rs A P
Phut Katoti ⁷ @ Re 0 7 0 per cart		7 7 0
Dharmada (charity) @ Re 0-1 0 per cart		0 10 3
		8 1 3

Price obtained by the seller at the Gonda market for 288 maunds 17 seers, i.e. (269 maunds 16 seers + 19 maunds 1 seer)	1 006 6 0
---	-----------------

Equivalent price per maund	3 7 9
----------------------------	-------------

¹ Zamindari and Chaudhari—Zamindari tax payable to the zamindar who may happen to be the owner of the market. Chaudhari fee payable to the manager or contractor employed by the zamindar

² Tulari—weighing charges

³ Palledari—handling and manipulation charges paid to the market labourers (palledars)

⁴ Bhandari—storekeeper

⁵ Kahari—a menial (female) who cleans cooking utensils

⁶ Gaddi Kharch—a deduction made to defray office expenses

⁷ Dhalta—weight allowance for “draftage”

⁸ Phut Katoti—deduction for giving change

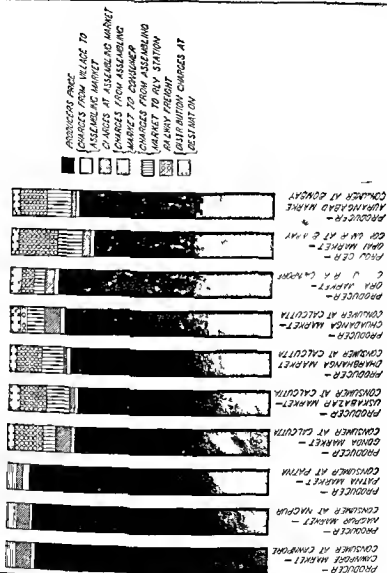
Taking the distance between market and village to be say 6 miles the cost of transport to the market may be reckoned as for Re 0 10 per maund, leaving the grower with Rs 3 6 9 per maund as the price fetched by his produce

The price spread from the consumer to the producer may now be summarised as follows —

	<i>Percentage of the price paid by the consumer</i>
Price eventually received by the producer on his holding Rs 3 6 9 per maund	73 7
Price received by the producer in the market Rs 3 7 9	
Assembling costs Re 0 5 6 per maund	7 5
	— — 81 2
Price paid by the buyer in the assembling market Rs 3 12 3 per maund	
Buyer's margin Re 0 1 3 per maund or 1 7 per cent (a very conservative estimate)	
Price received by the buyer in the assembling market Rs 3 13 6 per maund	
Distribution costs to consuming markets including the upcountry dealers margin Re 0 14 0	18 8
Price paid by the consumer Rs 4 10 3	<hr/> 100 0 <hr/>

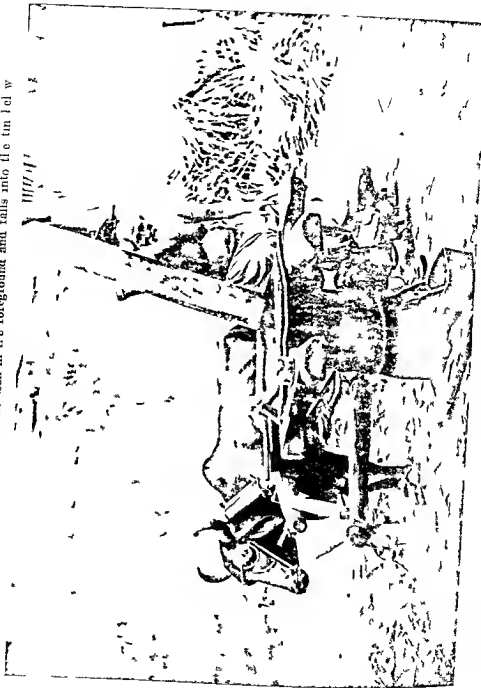
From this it would appear that 73 7 per cent of the consumer's price went to the producer. It must however be noted that the difference between the consumer's and producer's price depends on a number of factors. In the case illustrated above the wholesaler's margin at Gonda has been taken as only Re 0 1 3 per maund and it has been assumed that the Gonda merchant who forwarded the consignment to Calcutta bought the goods in the market directly from a producer. Actually however the linseed may have first passed from the producer to a village merchant before coming to market so that the total value paid by the village merchant to the producer in the first instance and the price received by the former when he disposed of the goods in the market might differ considerably. Again the goods may have changed hands several times between the market and its eventual destination with the result that the share of the consumer's price would diminish every time the goods changed ownership, the more so when both parties act as principals in which event there is always a difference in the buying and selling prices.

*TYPICAL INSTANCES OF PRICE SPREADS
FOR LINSEED*



A TYPICAL VILLAGE GHANI

of the vent seen in the foreground and falls into the tin l cl w



All these elements tend to reduce the proportion of the consumer's price received by the producer. On the other hand the grower may get a larger proportion of the price when the seed is sold direct to an oil mill at or near the assembling markets.

The price spreads between the producer and consumer in different markets are summarised in Appendix XLIII and illustrated in the diagram facing page 194. The producer's share in the ten representative instances taken varied between 67·7 per cent and 91·2 per cent of the price paid by the consumer assuming in all cases that the produce was brought to the assembling market direct by the producer. The amount of linseed brought by producers has been estimated to form one fifth only of the total quantities brought to the assembling markets (Appendix XXII) while three fourths reach the assembling markets through village merchants and *beoparis*. In such cases the share received by the producer would be less than that shown in the representative instances given. Allowing for this factor, it may be reckoned very roughly that on an average the cultivator's share of the price paid by the consumer cannot be much more than about 60 per cent only.

E—Trade Associations and trading in futures

(1) NUMBER AND LOCATION

Organised trading in linseed is confined only to Calcutta and Bombay. The associations concerned number eight and are as follows—The Calcutta Wheat and Seeds Association, the Indian Wheat and Seeds Association, the Indian Produce Association and the Calcutta Grain, Oilseed and Rice Association all at Calcutta. Those at Bombay are the Grain Merchants Association, the Marwadi Chamber of Commerce, the Seed Traders' Association and the Grains and Seed Brokers' Association.

(2) OBJECTS, CONSTITUTION, MEMBERSHIP, AND SOURCE OF REVENUE

The main objects of these institutions are essentially the same, namely, to promote and protect the interests of the trading community dealing in primary produce such as oilseeds and cereals, to frame rules and regulations for the conduct of sales and purchases, to establish uniformity in trade usages and to provide facilities for arbitration in disputes. None of the associations above mentioned participate in the buying and selling of produce either on their own behalf or on their members' account. A very important function of the majority is to serve as a clearing house for the adjustment of claims and liabilities resulting from transactions between their members in respect of "futures" contracts. The chief commodities apart from cotton and jute, in which there is trading in futures are wheat, barley, gram, linseed, groundnuts and rapeseed. But this by no means exhausts the list of articles figuring in the schedules of a number of kindred institutions.

Most of the associations to which reference has been made above are constituted under Section 26 of the Indian Companies Act, *i.e.*, on a non profit sharing basis. The relevant section laying down that

the property, capital and income of an association be applied only towards the promotion of its objects and that no bonus or dividend be paid to members past or present, except on the winding up of the company. In this respect the associations concerned are on a somewhat different footing from the great majority of the institutions handling transactions in wheat and other commodity "futures" particularly those in the Punjab and the United Provinces. The latter are registered under Section 13 of the Act and their Memoranda and Articles of Association entitle them to carry on the business of banking, warehousing, merchants and commission agents in any article or commodity to lend or invest the moneys of the company in commercial enterprises or any other kind of undertaking and to enter into arrangements for the sharing of profits. Both types of associations are with limited liability.

Membership is open to persons or firms engaged in trading in agricultural produce. An entrance fee is payable on election and an annual subscription is charged from the members.

The admission fees and subscriptions payable by ordinary members of the different associations are tabulated below —

	Admission fee	Annual subscription
Calcutta	Rs	Rs
The Calcutta Wheat and Seeds Association	500	48
The Indian Wheat and Seeds Association	11	12
The Indian Produce Association	1 101	24
The Calcutta Grain, Oilseed and Rice Association	25	60
Bombay		
The Grain Merchants Association	51	25
The Marwadi Chamber of Commerce	500	51
The Seed Traders Association—		
Merchant Class	20	11
Broker Class	51	21

The sources of revenue of most of the above associations are derived from subscriptions, arbitration, survey and tender fees and from fines. The Indian Produce Association, Calcutta, has an additional source of income in that members of that body charge their clients Re 0 10 for every transaction entered into by them. This money is paid into the funds of the association and goes towards the maintenance of the various services provided by it.

The management of these associations is invariably vested in a board or managing committee composed of various office bearers which usually include a President, one or more Vice Presidents, a Secretary and one or more Joint or Assistant Secretaries and members whose numbers may vary from 7 to 30.

(3) BUSINESS METHODS OF DIFFERENT ASSOCIATIONS.

The services and facilities offered, and the terms and conditions imposed on their members by the different associations are in the main similar. The quality of linseed, the basis of refraction, the scales of allowances for excess refraction, the procedure to be followed in drawing samples, the analysis of samples, the months of delivery and settlement, the routine for conducting settlements and units of transaction for "futures" contracts are all defined and members are bound to abide by the rules and regulations of the association and to refer all disputes to arbitration.

The sphere of influence of each association is determined by long usage and sometimes by mutual agreement. Each deals in different commodities or different types of transaction. For example, at Calcutta, the Calcutta Wheat and Seeds Association, and to a smaller extent the Indian Wheat and Seeds Association are primarily engaged in the regulation of trading in linseed (and wheat) "futures" while the Indian Produce Association controls the conduct of transaction in "actuals" or ready goods. At Bombay ready business in linseed and other oilseeds and grains is subject to the rules of the Grain Merchants' Association while trading in linseed "futures" comes under the auspices of the Marwari Chamber of Commerce.*

The following is a more detailed description of the *modus operandi* of some of the associations referred to above.

The Calcutta Wheat and Seeds Association was first registered in 1920 and has 187 members. Its offices are located in rented premises in a building in Cotton Street. The actual trading in linseed (and wheat) takes place in a paved courtyard between two high buildings a number of rooms of which are rented by firms of brokers (see plate opposite page 198). The rooms in the upper floors are largely used for residential purposes and have common access to balconies on each floor directly overlooking the courtyard.

The unit of transaction is 10 tons and values are quoted in multiples of $1\frac{1}{2}$ pies per maund. The opening and closing rates are chalked up on a board daily. Transactions are between members only and the hours of business are usually from 8.30 A.M. to 5 P.M. on week days. On Sundays the market is open for two hours only in the morning between 9 and 11 A.M.

Transactions are entered in a note book and each party's signature is taken. No contracts are exchanged although the association actually has a printed contract form a copy of which is given in Appendix XXXVI. Ordinarily, every member is required to be covered by a guarantor but it is understood that this condition is not always insisted upon.

*Since January 1938 the Seed Traders Association, Bombay, has opened a linseed contract on the same basis as the Marwari Chamber of Commerce.

All contracts are subject to a weekly settlement at the closing rate* at 4.30 P.M. each Saturday, as determined by the Committee of the association.

The difference between the rate at which the contract is standing and the settlement rate fixed by the Committee is payable or recoverable as the case may be on the total quantity of the contract. Buyers and sellers are responsible for making out their own individual accounts and these are sent to the office of the association at the latest by noon on the following Monday. The association draws up cash slips against those parties who are debtors and they are required to settle all sums due from them by 8 P.M. the same evening. Failure to do so results in the defaulter being posted as insolvent on the following morning, his guarantor being called upon to settle all outstanding accounts.

After the tenth day of May and September—the two delivery months—no fresh transactions can be entered into for the months in question. The due date in both cases is the first day of the month following the settlement month. Both buyers and sellers may exercise options between the 11th and the last day of the settlement month. Railway receipts for goods consigned but not yet received in Calcutta are accepted up to the 25th day of the delivery month.

Should buyers fail to take delivery of the goods, sellers have the option of reselling in the open market on account and risk of the buyers. On the other hand, if sellers fail to give delivery, buyers are entitled to a compensatory allowance at the rate of Re. 0.10 per maund plus the difference between the contract rate and the rate fixed by the Association on the due date.

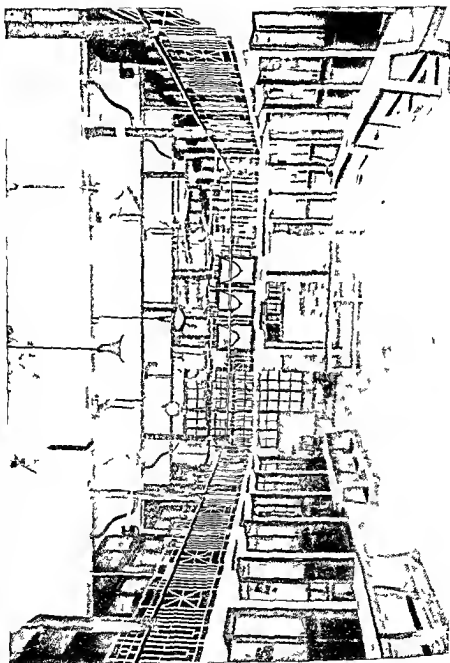
The actual quantities outstanding for delivery on due date are only a small proportion of the total contracts entered into. Unfortunately, individual contracts are not registered with the association so that it is impossible accurately to gauge the volume of futures transactions at Calcutta (or even at Bombay). Enquiries, however, show that 2,000 to 5,000 tons may be regarded as a normal day's turnover. Sometimes, however, during hectic periods of trading when prices are fluctuating violently or the market is very firm or very weak, contracts for as much as 50,000 tons may change hands in a day. At the very lowest estimate, therefore, not less than 600,000 tons of linseed (more than the entire Indian crop) are bought and sold in one season at Calcutta. Actually, this figure must be very considerably exceeded if due regard be paid to the periods in which the market moves rapidly one way or the other and it would probably be more correct to compute the volume of futures trading as somewhere between 1 and 2 million tons annually—possibly more.

*The rate so fixed was often found to be an average of the current buying limits on the Saturday of two large exporting firms, particularly during the height of the season when both are usually active buyers. The powerful influence of the export demand on the price level in India will therefore be readily appreciated.



Now—This is the place where almost all the "lunatics" business for who it used to be in Calcutta is conducted

The futures trading hall in the new premises of the Marwadi Chamber of Commerce, Bombay



As railway receipts and delivery orders tendered in settlement of May and September transactions pass through the books of the association it is possible to ascertain the actual quantities of linseed delivered in liquidation of futures contracts. The data given in the following table show that during the last three years actual deliveries formed an infinitesimal proportion of the total volume of futures transactions.

Futures' contracts settled by actual delivery at the Calcutta Wheat and Seeds Association

(Tons)

Tenders made by —	1935		1936		1937	
	May	September	May	September	May	September
Railway Receipts	720	620	1 930	2 000	140	530
Delivery Orders	1 350	3 590	440	2 960	50	2 420
Total	2 070	4 210	2 370	4 960	190	2 940

The Indian Wheat and Seeds Association has no trading ring. Business between members of whom there are 133 is transacted through the 72 brokers affiliated to the association who personally visit sellers and buyers or communicate with the parties by telephone. On completion of a deal the seller's representative goes round to the buyer as soon as convenient but usually not later than the day following the transaction and secures the signature of the party concerned. The contract is then registered with the association.

The total quantities of linseed involved in the contracts recorded by the association were as under during the past 4 years —

	Tons
1934	22 000
1935	45 000
1936	35 000
1937	22 130

The Indian Produce Association is a body composed of 99 whole sale dealers and brokers. It regulates the usages of trade in respect of ready transactions as between parties in the internal trade only. The association operates the merchants shelter at the Howrah goods sheds which provide a focal point and a convenient market for spot trading in all kinds of grains and seeds arriving by rail. This association is not concerned with futures trading and in common with the other associations at Calcutta and Bombay it does not handle pledge goods by making advances against such.

The Calcutta Grain, Oilseed and Rice Association—This is a small association recognised by the Bengal Chamber of Commerce since July 1884, now composed of 12 members of whom 3 belong to the Chamber. Its chief functions are to promote and protect the interests of its members, to maintain uniformity in rules, regulations and trade usages and to adjust controversies between them. The two largest exporting firms do not belong to this association although both are members of the Bengal Chamber of Commerce, and the association plays little part in the linseed trade.

The Grain Merchants' Association, Bombay—This is probably the oldest established body in the country engaged purely in the regulation of the grains and oilseeds trade. It was formed nearly 50 years ago and has a membership of 325. It has no direct concern with "futures" trading in linseed, the option market for which is administered mainly by the Marwadi Chamber of Commerce. The Association is primarily interested in promoting the interests of its members and in regulating trade practices in the local market with particular reference to delivery contracts and ready transactions. The association has a well equipped department for the analysis of all kinds of grains and seeds handled at the port. It also maintains price records for a number of primary products. The scales of allowances for various commodities approved by the association are now recognised and accepted by all sections of the grains and seeds trade at Bombay.

Closely associated with the Grain Merchants' Association is a kindred body established for some 20 years or more, known as the Seeds Traders' Association. It has a membership of 230, the majority of whom are also members of the Grain Merchants' Association. Its constitution is similar to that of the older body but in addition to purely advisory functions it controls the "futures" market for groundnuts, cottonseed, castorseed and certain other oil seeds. It is interesting to note that trading in linseed "futures" for which there have been provisions in the rules of the association for many years has recently been resumed. The Seeds Traders' Association rents a small building in proximity to the Dana Bunder market which is also near the office of the Grain Merchants' Association. The courtyard within this building has been converted into a trading ring in which the brokers congregate daily. The streets in the neighbourhood are mostly occupied by merchants' offices and godowns.

The Marwadi Chamber of Commerce—The "futures" market for linseed in Bombay until lately was controlled exclusively by this association which has recently moved into a new and spacious building on Kalhadevi road. A number of amenities are provided by the Chamber, amongst which is a spacious trading hall (illustrated opposite page 199) surrounded by conveniently situated rooms rented out to members, and fitted with telephones. The Chamber consists of 232 members of which, as its name would imply, a large proportion are of the Marwari community. Membership is divided

into 4 sections and embraces commission agents *muccadams** brokers, shroffs or bankers

The methods adopted by the Marwadi Chamber of Commerce in regulating futures trading in linseed are very similar to those of the Calcutta Wheat and Seeds Association which have been described in some detail earlier in this section. The unit of transaction⁶ is larger at Bombay viz 25 tons as against 10 tons at Calcutta but the months of delivery are the same (May and September). On the other hand the Marwadi Chamber's contracts are subject to a monthly settlement the difference between the contract rates and the actual values ruling on the 25th day of the delivery month as fixed by the Board of the Chamber being adjusted on the last day of the settlement month. The Association does not act as a clearing house in the sense of receiving payment from or making payment to members on account of monthly differences. The onus of making up their own accounts is placed on the trading members themselves and payments and settlements of differences are effected directly between the members concerned. The Chamber is mainly concerned with checking delivery orders when the delivery months come round in order to fix the last buyer by whom the goods have to be taken delivery of.

The quantities of linseed actually delivered in settlement of outstanding futures contracts will be seen from the following table —

Futures contracts settled by actual delivery at the Marwadi Chamber of Commerce, Bombay

(Tons)

	1932	1933	1934	1935	1936	1937
May	4 575	3 325	8 200	3 850	7 050	5 975
September	7 500	19 825	21 300	11 125	28 075	5 825
Total	12 125	23 150	29 500	14 975	35 125	11 800

The Bombay Grain and Seeds Association is an association of comparatively recent origin. It is closely associated with another body called the Bombay Grain and Seeds Brokers Association in whose premises futures trading by members of both bodies takes

*In the trade the word is usually spelt as given in the text. It should more correctly be spelt *Mugaddam* meaning literally first or chief. The term was originally used to denote the head of a gang of labourers and consequently a labour contractor. On the west coast of India the word has acquired a wider significance and is applied to the middlemen who figure largely in the Bombay grain and oilseeds trade and who are often of considerable repute. The *muccadam* differs from a broker in that the latter only deals in prices while the *muccadam* also specialises in the physical handling and storage of produce on behalf of his clients. The *muccadam* is prototype in western markets is the factor.

place in units of 5 tons only. Its rules appear to be similar to those of the Marwadi Chamber of Commerce but little or no control over the forward transactions of its members seems to be exercised as the association has apparently more than once had to suspend business for considerable periods. During a part of 1937, for example it was moribund.

It might appear that such an institution caters for the small trader. Such is probably the case to some extent but evidence is not lacking to show that where the unit of transaction is small a somewhat irresponsible speculative element predominates in the market concerned. Control becomes lax and with the absence of any intention, and frequently the inability, to give delivery the real purpose of a "futures" exchange is frustrated and may on occasions have serious repercussions on the markets outside. Size and financial stability are essential pre-requisites in any institution handling trade in "futures". Members should be required to make a heavy deposit with the association so that large stakes which each firm or individual would thus possess would tend to create a greater sense of responsibility.

It will have been observed that normally the volume of "futures" transactions liquidated by actual delivery is far greater in Bombay than at Calcutta. Two factors are mainly responsible for these conditions. In the first place Calcutta is a large milling centre and consumes far more linseed than Bombay. Considerable stocks of linseed are held by the mills at Calcutta amounting in some years to as much as 15 000 tons monthly between the period May and September. These supplies are railed to the mills' own sidings in various parts of Calcutta and the suburbs and are kept in their godowns. Such hedge sales as may have been made in the September option by brokers handling the business of the mills are reversed according to the requirements of their principals as convenient so that as far as can be ascertained no linseed from these sources is ever tendered.

Another reason for the comparatively large quantities of linseed tendered in liquidation of "futures" contracts in Bombay would appear to lie in the fact that the greater uniformity of procedure which appears to exist in all sections of the trade at Bombay makes such large deliveries possible with a minimum of friction or disputes.

At Calcutta conditions were found to be somewhat less satisfactory there being a wide gulf between some of the usages as practised by shippers and those adopted by sellers notably in the matter of sampling and analysis and it has been observed that no large shipper would willingly tender linseed against option sales in Calcutta if such a course could possibly be avoided owing to the uncertainties attendant on such a procedure under present conditions. The general adoption of a standard contract as indicated in Chapter VI the unification of market customs and their maintenance by a joint representation of shippers and other buyers and sellers in the form of an association or committee somewhat on the lines of the Joint Grain and Seeds Committee at Karachi would probably go a long way to promote smooth working in this market.

INTER-CHAPTER NINE

It is difficult to say in many cases how much the producer actually gets for his linseed. Barter arrangements and payments and deductions in kind make the calculation complicated. When the grower takes his linseed to be crushed in the village *ghani* he may take in return all the oil and leave the cake, or alternatively he may be given 18 to 22 per cent of the weight of the linseed in the form of oil. This represents about two thirds of its oil content. When he takes linseed to a market where large oil mills are located, the producer may be fortunate enough to get over 90 per cent of the price paid, but on an average it would appear that the cultivator only gets about 10 annas in the rupee paid by the large mills and exporters.

In distributing markets many of the market charges levied in assembling markets are repeated. Two or three more charities are usually provided for, along with charges like *jalpani* and payments to the cashier for drawing up the hill. Other new charges also are to be found such as *phut katoti*, which is sometimes exacted at the rate of 7 annas per cart merely for giving change. Seeing that linseed frequently passes through more than two markets, the cumulative burden on the producer, of these various market charges can be appreciated and some action is urgently required for their regulation.

The business of distribution is mainly done by the *pakka arhatiya* who procures his supplies through the *kachcha arhatiyas* in the assembling markets. The large exporting firms at one time used to maintain buying agents upcountry but following the depression of 1931 most of these were withdrawn and the business conducted very largely through guarantee brokers. The amount of linseed distributed by co operative organisations is

absurdly small—the few sales by co operative sales societies in Bombay, for example, do not exceed 20 tons per annum

The finance of the trade is mainly in the hands of the indigenous bankers (*shroffs*) and the *pakka arihatiyas* who customarily advance 70 or 80 per cent of the value of the goods sent to them for sale on commission. The rate of interest charged on such advances varies with the state of the market and the financial status of the client but it is generally between 6 and 9 per cent per annum. Joint stock banks do a certain amount of business at the larger centres where the godowns can be brought under their direct control but in the main *shroffs*, by their more intimate knowledge of their clients, are in a better position to do business in the smaller centres and can safely make advances which would be regarded as too risky for a bank with the limited knowledge at its disposal. It would seem therefore that the *shroff* will continue to remain the main factor in financing the distribution of linseed and this business could apparently be facilitated by the development of an open bill market for negotiating first class *hundis*.

The trade at the terminal markets of Bombay and Calcutta is governed very largely by four associations at each centre. There is one desirable feature about these associations namely that they are all non profit sharing institutions. One or two of them however do not appear to insist on sufficiently large admission fees and subscriptions from their members and this always tends to raise doubts as to the stability of the association concerned. Particularly in the case of those associations controlling a "futures" market stability is essential and the more this business can be concentrated on the premises of the larger associations the better, since this tends to limit the amount of irresponsible speculation which is too common

a feature of a small association. Unlike wheat there are no trade associations dealing in linseed "futures" located in upcountry centres, and the provision of a limited number of "futures" linseed markets controlled by local associations upcountry, is a matter which might quite well be taken into consideration by the trade. At Bombay and Calcutta it seems desirable that the various associations concerned at each centre should take steps to secure a greater uniformity in the local market practices and that this might be secured by a joint representative body of the various associations somewhat on the lines of the Joint Grain and Seeds Committee which already exists at Karachi. A closer union of all the bodies concerned in an all India trade federation would bring about a still greater degree of co ordination and uniformity in market practices.

CHAPTER X—THE MANUFACTURING AND DISTRIBUTION OF LINSEED PRODUCTS

A—Linseed crushing

Linseed crushing appears to have been practised in India from the remotest times but milling as an organised industry dates from comparatively recent years. Prior to 1900 less than 10 per cent of the total crop was retained in India for seed requirements for domestic consumption and for crushing. During the three years immediately preceding the War India's retention had increased to an average of about 28 per cent of the crop and by the triennium ending 1936-37 as much as 51 per cent of India's linseed product was utilised within the country. As indicated in Chapter II it is estimated that during this period about 42 per cent of the total production was utilised for the manufacture of oil and cake.

(1) TYPES OF CRUSHING ESTABLISHMENTS

Linseed is crushed under two distinctly separate conditions (a) in the village *ghanis* the motive power for which is generally supplied by bullocks and (b) by power driven mills and rotary *ghanis*.

(a) *Village ghanis*—The *ghani* also known as a *kolhu* or *chekku* (the latter being the term generally given in Southern India) are used for the expression of oil from practically any kind of oilseed and although they may vary in point of size and detail of construction the main principle of operation is exactly the same. A typical village *ghani* shown in the illustration facing page 190 consists of a mortar made of wood—generally the hollowed out trunk of a tree—in which a wooden pestle is rotated. The pressure brought to bear by the pestle on the oilseed within the mortar is regulated by means of weights consisting of large stones. The extraction of oil in a village *ghani* is a somewhat slow process. For example it has been ascertained that the smallest sized *ghani* normally encountered in certain parts of the country may take the greater part of the day to handle 4 or 5 seers of linseed while the larger *ghanis* may be capable of dealing with more than one mannd of linseed per day. The variable factors are of course the number of draught animals used their size and strength and the number of hours worked per day.

(b) *Power driven mills and rotary ghanis*—The power driven oil mills operate with one or other or a combination of any of the following types of machinery—(1) hydraulic presses (2) expellers (3) rotary *ghanis*.

(1) *Hydraulic Presses*—The oilseeds are first ground by rollers to make meal which is then heated in steam jacketed kettles. The meal having been heated and moistened to the required degree is drawn off in equal charges by a moulding machine (hydraulic or steam) which compresses the meal to a certain extent and wraps it in

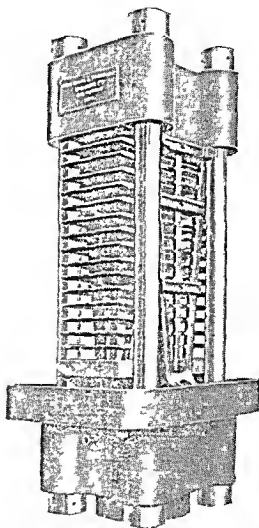
[Facing

Two expellers operating under ordinary working conditions



[Facing page 207]

An Anglo American hydraulic press



[By courtesy of Messrs Marshall Sons & Co (India), Limited]

a press cloth. The compressed charges of meal covered by the press cloth are inserted between the plates of the presses, and subjected to pressure from hydraulic pumps either directly or through accumulators—the maximum pressure being about 2 tons per square inch. The oil flows from the sides of the presses and is collected in tanks. The residue—the cake—is removed from the press after the pressure has been released.

The presses may be open type, known as Anglo American presses (see plate opposite), or of the closed type known as cage presses. The former are generally used for linseed whilst the cage presses are often used for oilseeds with a higher oil content such as groundnut and castor.

(u) *Expellers*—Although some oil seeds are crushed in the expellers whole and either hot or cold, linseed is generally fed into the expeller after being rolled into meal which is heated and moistened in a long steam jacketed trough fitted over the expeller. The extraction of oil takes place within a steel cage by means of a series of hardened steel worms, so arranged on a shaft which revolves as to produce gradually increasing pressure as the seeds are carried from one end of the cage to the other. The oil is expelled through the perforations in the cage and the residual cake is forced through the end of the cage opposite to the feed. This is clearly seen in the plate facing page 206 which shows two typical expellers in action.

(m) *Rotary ghanis*—The rotary *ghanis* driven by mechanical power are similar to the village *ghanis* in principle, with the only difference that both the mortar and the pestle revolve, the latter being made of cast iron instead of wood. The lay out of a typical oil mill using *ghanis* will be seen from the photograph facing page 208 while a close up view of the *ghanis* given in the plate facing page 209 will enable the constructional details to be clearly seen. Rotary *ghanis* are invariably worked in pairs and they may be grouped together in any number of units ranging from one or two pairs to several hundreds. The pressure exerted by the revolving pestle derives from heavy cast iron weights carried at the end of an arm one end of which is directly connected to the pestle.

Other types of machinery for oil extraction such as cage and screw presses and solvent extraction plants are seldom used for crushing linseed in India. It must, however, be noted that the plant used in the linseed crushing industry is also suitable for the treatment of other kinds of oilseeds and most of the mills use the same machinery with necessary adjustments, for the handling of other oilseeds e.g., mustard, rape, toria, sesamum, groundnut, etc.

(c) *Comparison of different types of plant*—Each type of plant has its own particular advantages or disadvantages. For example a village *ghani* requires very little capital investment, no engineering skill whatever to maintain it and at the same time provides the cultivator with employment when he is not occupied with other agricultural operations. Moreover when a *ghani* is operating in an area in which

a particular oilseed is produced and its oil and cake consumed locally, transportation costs are very largely eliminated to the benefit of producer and consumer. The main drawbacks of the *ghani*, however, are in the slowness of its operation and its inefficiency in that a relatively high proportion of oil is left in the cake. If the labour expended by the operator (*teli*) and his family were to be reckoned on a cash basis crushing by *ghani* would appear to be an economically unsound proposition.

The hydraulic press, with the other machinery involved in its operation such as rolls heating kettles, hydraulic pumps, accumulators, cake paring machines, etc., require a large initial outlay, a considerable extent of space for installation and a good deal of labour for operation. On the other hand hydraulic press cake fetches a higher price than expeller cake in export markets.

The expeller which appears to have gained considerable favour with millers in recent years is a self contained and comparatively small unit which requires a small ground space and can be run with little labour. (See plate facing page 212). It is moreover claimed that it produces a lighter coloured oil than the press. Be that as it may, the former advantages have given an impetus to the installation of expellers in recent years and their number has greatly increased. It is reckoned that the total number of expellers operating in India on different oilseeds is probably somewhere between 600 and 700.

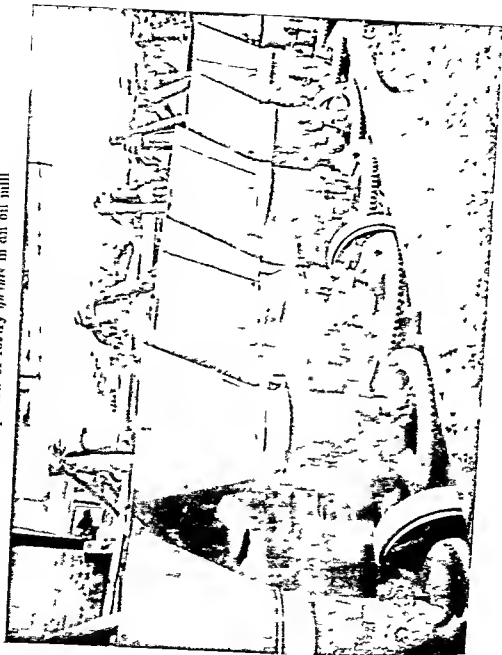
The rotary *ghani* is a comparatively crude piece of mechanism which is not only wasteful in power consumption but also fails to attain the efficiency of the hydraulic press or the expeller. It appears to be capable of considerable constructional improvement and the subject is worthy of serious consideration. The main points in favour of the rotary *ghani* however, are its adaptability for different oilseeds its low initial cost and the fact that almost all the parts are made locally often on the premises of the mill itself. Its use is greatly favoured for certain oilseeds such as mustard and rape as the oil produced by the slow rate of expression comparable to the village bullock *ghani* is considered to have a characteristic odour and pungency. Although this factor is of no special importance in linseed linseed oil produced by village and rotary *ghanis* commands a decided preference over expeller or press oils in certain areas—for example in Central India—particularly when used for edible purposes.

Although the efficiency of the village *ghani* cannot be compared with modern machinery and enquiries in various provinces indicate that their numbers are very slowly on the decline it is most unlikely that even with the advance of industrialisation the village *ghani* will ever be entirely superseded. *Ghani* crushing plays an important part in rural life so that any improvement which would tend to increase its efficiency must be regarded as of primary importance. Further the crushing of oilseeds by the village *ghanis* is closely linked up with the consumption of oilcake by cattle and its utilisation for



Interior of a typical small oil mill operating batteries of rollers

A close up view of rotary oil mill



manure Any expansion in these directions would undoubtedly benefit the cultivator by improving both his land and his stock

(2) NUMBER AND LOCATION OF CRUSHING ESTABLISHMENTS AND QUANTITIES OF LINSEED ESTIMATED TO BE CRUSHED

(a) *Village ghanis*.—It was indicated in Chapter II that the *ghanis* handle a number of other kinds of oilseeds according to season, local production and other market factors. The crushing of linseed by *ghanis* is more common in those parts in which linseed oil is used as an edible oil, for example in the Central Provinces and Central India States. The quantitative requirements of linseed for crushing in the village *ghanis* have already been discussed in Chapter II* and the following table summarises the position —

	Estimated number of <i>ghanis</i>	Estimated average annual requirements of linseed (tons)
United Provinces .. .	1,47,737 [†]	15,000
Bihar (and Orissa) . . .	83,000	13,000
Central Provinces .. .	18,551	16,500
Central India and Rajputana States	20,000	18,000
Punjab .. .	40,000	1,700
Kashmir .. .	3,000	1,500
Assam . . .	} No crushing by <i>ghanis</i>	
Bengal .. .		
Bombay . . .		
Hyderabad . . .		
Madras .. .		
Total		65,700

(b) *Power driven mills and rotary ghanis*.—Although industrial establishments employing more than 20 persons have to be registered under the Indian Factories Act, they are not required to render periodical returns showing their consumption of raw material and output

*See page 53

†Cattle Census Report of the United Provinces, 1935

of finished products. No data are therefore available from official records regarding the quantities of the different oilseeds crushed by the oil mills or of their respective crushing capacities. The total number of oil mills* in India with special reference to those mills which have been ascertained to be crushing linseed (exclusively or along with other oilseeds) are shown in the map facing page 44 their number and location being as follows —

Number of power driven oil mills in India

	Total number of oil mills	Number of mills crush- ing linseed.
<i>India—</i>		
Assam	15	NL
Bengal	41	9
Bihar (and Orissa)	38	26
Bombay	62	8
Central Provinces	64	41
Madras	28	NL
Punjab	61	
United Provinces	61	27
Baroda	16	
Bombay States	5	
Central India States	4	1
Cochin	7	
Hyderabad	61	3
Kashmir	7	7
Kotah	1	1
Mysore	12	
Travancore	13	
Total	519	123
<i>Burma</i>	32	NL

*A number of concerns handling copra only have not been included.

The position in the different areas may be summarised as follows

United Provinces—Out of the 61 mills in the United Provinces 27 were reported to be crushing linseed. Statistics collected from 24 of the latter indicate that there are in operation 16 sets of presses 62 expellers and 2 373 rotary *ghanis*. The principal milling centre in the province is Cawnpore.

The quantities of linseed crushed vary from year to year depending on the relative values of different oilseeds and oils and some 19 000 tons were estimated to be crushed in 1934-35. The annual consumption on an average is somewhere between 20 000 and 25 000 tons.

Bihar—There are 38 oil mills in this province most of which are equipped primarily for crushing mustard. As far as can be ascertained the number of the rotary *ghanis* is not less than 3 000 while there are 30 expellers. The milling industry is concentrated in the large towns situated along the south bank of the Ganges mainly because of the facilities afforded by cheap river transport. About 15 000 tons of linseed were estimated to be crushed by 26 mills in 1934-35 the annual consumption ranging between 12 000 and 20 000 tons.

Central Provinces—In the 64 mills of which records have been obtained in this province there are in operation 14 sets of hydraulic presses 70 expellers and about 100 rotary *ghanis*. It was ascertained that as many as 41 mills were crushing linseed the average annual consumption being estimated at approximately 40 000 tons. The chief centres of crushing are Raipur Bilaspur and Nagpur.

Bombay—Although there are as many as 62 oilseed crushing establishments operating at least 14 sets of hydraulic presses and some 230 expellers and 800 rotary *ghanis* in the province linseed is crushed in 8 mills only mostly by expellers the chief centre being Bombay. About 9 000 tons are estimated to be crushed annually on an average.

Bengal—There are 44 oil mills in this province the majority of which are primarily concerned with the crushing of mustard and rapeseed. These mills have 11 sets of presses 25 expellers and nearly 4 700 *ghanis*. Linseed is handled in 9 mills only of which 2 situated near Calcutta crush linseed exclusively. These mills are mainly equipped with hydraulic presses and are among the largest in the country. About 25 000 tons were estimated to have been crushed in 1934-35 and the annual consumption would appear to range between 20 000 and 30 000 tons.

Other provinces and States—The quantity of linseed crushed in other parts of India is comparatively small. For instance only 1 500 tons are crushed in Hyderabad State while the mills at Indore Gwalior, Kotah and other Central India and Rajpntana States jointly consume nearly 5 000 tons much of which goes into the edible trade.

In Kashmir 6 expellers and 2 presses deal with about 3 000 tons of linseed per annum. In the Punjab, records have been obtained of 61 mills but the crushing of linseed is confined only to the rotary *ghanis* in the Kangra district and to the extent of about 200 tons only. In Assam, although there are 15 oil mills, these do not crush linseed. The Madras and Sind mills do not appear to handle any linseed whatever. This is also the position in Burma.

As has already been indicated in Chapter II, the total quantities of linseed estimated to have been crushed by bullock driven *ghanis* as well as by the power driven mills during the triennium ending March 1937, amounted to nearly 200,000 tons annually.

(3) YIELD OF LINSEED OIL AND CAKE

Oil and cake yields necessarily depend upon the oil content of the linseed, the proportion of impurities present, and the efficiency of the plant employed. In the laboratory, the oil contained in the various samples of linseed collected from different parts of India was found to vary between 38 and 48 per cent (on a cleaned seed basis). Enquiries from a number of oil mills and *ghanis* showed that the average yield of oil on a commercial scale, from linseed as received by the mills, i.e., including its impurity content, is about 33 per cent from small linseed and 34 to 36 per cent from bold linseed. The yield obtained by the village *ghanis* is considerably lower varying from 25 to 30 per cent only. Having regard to these variations the average yield of oil manufactured by all the processes employed in India may be reckoned roughly as one third by weight, of the quantity of linseed crushed the residue after the oil has been extracted representing approximately two thirds.

The crushing of linseed involves a certain amount of milling loss. From the fact however that the oil and cake normally total up to the weight of linseed crushed it would appear that this loss is offset by various factors such as gain in weighing when taking deliveries of linseed, gain in weight during storage in certain months and by the addition of steam during processing.

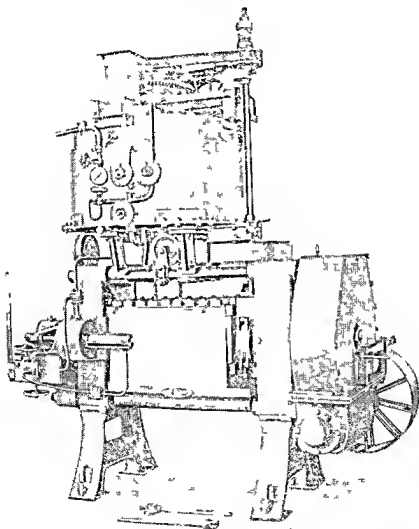
(4) COST OF CRUSHING

The cost of crushing linseed varies considerably in different power driven mills, and depends on a large number of factors such as the type, capacity and efficiency of the plant used, the number of hours worked daily, the total turn over, labour expenses, cost of stores, rents, rates and taxes etc. It would seem that operating costs were reckoned by a number of concerns to range between Re 0.60 to Re 1.40 per maund on the weight of linseed crushed or from Re 1 to Rs 3.80 per maund of oil manufactured.

The cost of crushing in the village *ghanis* is most difficult if not impossible to estimate because the *teli* and his family all work at the *ghani* and their labour cannot be assessed in terms

[Facing pa

AN OIL EXPELLER



This machine is a small self contained unit used for expressing oil
from various oilseeds

[By courtesy of Messrs Marshall Sons & Co (India), Limited]

of cash with any degree of accuracy. Besides, the *tel* is often paid in kind for crushing linseed brought by others. He returns the oil to the owner of the linseed, keeping only the cake as his reward.

(5) LINSEED PRODUCTS

The chief products from linseed are linseed oil and linseed cake. The former is marketed as "raw" oil or as "hoiled" oil after treatment by a chemical process to which reference will be made later. Other products which are only occasionally manufactured in India are linseed meal and linseed cake meal which are merely linseed and linseed cake ground down.

B—Linseed oil

(1) PRODUCTION

The total production of linseed oil from 200 000 tons of linseed estimated to be crushed in India by the large mills and *ghanis* would approximately amount to about 67,000 tons or 16.25 million gallons.

(2) QUALITY

(a) 'Raw' linseed oil—Before the linseed oil manufactured by presses, expellers and rotary *ghanis* is sold it is usually filtered or "tanked", or both for a period in order to allow the mucilage and foreign matter in suspension to settle down. On the other hand the oil produced in the village *ghanis* does not receive any further treatment and is put out for sale practically straight from the *ghani*. Consequently, it is not as clear as the linseed oil turned out by the large mills. The colour of linseed oil depends largely on the temperature and methods of extraction. As a rule the oil produced by expellers is of a paler colour than the oil manufactured by other types of plant. Apart however from these small differences in physical characteristics there appear to be no appreciable chemical divergences—at least none have been established in the research work done so far—as between the raw linseed oil manufactured by modern machinery and that turned out by the village *ghani*.

The quality of the oil also depends to a certain extent on the condition of linseed itself. It has already been pointed out in Chapter VII that prolonged storage may affect the quality of linseed while damp and moisture are also harmful. Accordingly, linseed containing a high proportion of damaged grains is apt to yield an oil with a high acid value. Fresh linseed oil generally has a turbid appearance and is, as a rule, unsuitable for the manufacture of varnishes etc. During storage for a considerable period it continues to deposit matter in suspension and some of the large mills which have ample storage accommodation make it a point not to deliver oil which has been tanked for less than two to three months.

For industrial purposes, a clear bright oil with good drying properties is required and the paler coloured oils are generally given

preference In the edible trade however somewhat different factors predominate For human consumption the oil produced by the village *ghanis* is often considered superior to the oil turned out by rotary *ghanis*, expellers and presses as it is considered to possess a sweeter taste and a more pleasant flavour This is reflected in the price of village *ghani* oil which is dearer than mill made linseed oil

(b) "*Boiled*" linseed oil—When exposed to the air, linseed oil absorbs oxygen and dries to form a firm elastic film On this property depends its main industrial use all over the world in the manufacture of paints varnishes linoleum printing inks etc The drying qualities of the oil yielded by Indian linseed is generally recognised as being superior to the oil manufactured from Argentine linseed

The drying properties inherent in raw linseed oil are increased by converting it to its "*boiled*" form This is achieved by heating the "*raw*" oil to suitable temperatures with certain chemicals known as "*driers*" The term "*boiled*" oil is, however a misnomer since in practice the oil is not heated to such a degree that it begins to boil The "*driers*" generally used are salts of lead manganese and cobalt e.g., manganese linoleate lead acetate, etc These are used in small quantities only and are believed to act as catalysts helping the oil to absorb oxygen

Boiled oils are marketed in a number of qualities for use under different conditions The different qualities of oil vary as to colour time of drying and consistency and are known to the local trade by such designations as Special Pale Boiled Pale Boiled Double Boiled etc The paler oils are used for white and lighter coloured paints and the darker oils for the deeper shades or where very quick drying is desired Again the term "*double boiled*" is a misnomer and does not signify as the word "*double*" would seem to indicate, that the oil had been boiled twice In the trade the expression is generally applied to a comparatively dark and quick drying oil

No statistics are available to show the production of boiled oil in India but enquiries from a large number of sources reveal that not more than about 15 per cent of the linseed oil manufactured in India is sold as boiled oil The total production of boiled oil by the mills in India may therefore be placed somewhere in the neighbourhood of 10 000 tons or roughly 2 4 million gallons The manufacture of boiled oil is confined to a few mills only the chief centres of production of this quality being Calcutta Bombay and Cawnpore

In addition to the boiled oil actually prepared for sale by the mills paint and varnish manufacturers often buy their requirements of linseed oil in the raw state and prepare the boiled oil themselves for use in their manufactures

(c) "*Reduced*" oils—These oils are mixtures of linseed oil and refined mineral oils turpentine etc and are often considerably cheaper than the genuine article "*Reduced*" oils are sold in large quantities and find a ready sale in many markets At Madras for example "*reduced*" oils were found to be in greater demand than

genuine linseed oils, as will appear from the following figures showing the relative proportion of the various qualities sold by a large distributor

"Boiled" linseed oil

Genuine—

In 5 gallon drums 6 per cent

In 1 gallon drums 1 per cent

"Reduced"—

In 5 gallon drums 29 per cent

In 1 gallon drums 6½ per cent

Besides "reduced" oils, there are to be found on the markets certain other oils termed "paint oils" which contain no linseed oil whatever and which are merely mixtures of mineral oils rosin etc. These oils are used as substitutes for boiled linseed oil mainly for interior paint work and although poor in quality in that their film has no lasting qualities they command a good sale owing to their cheapness. In some centres as for example Delhi sales of "paint oils" are equal to if not greater than those of genuine linseed oil.

(3) BRANDS

Linseed oil is generally marketed by the manufacturers under proprietary brands and trade marks. Different brands and marks are used by certain manufacturers to distinguish between the genuine and "reduced" oils. The total number of brands of raw and boiled oils on the Indian market appears to be not far short of 100. A few of the more important brands met with during this survey were known as Peacock Swan Elephant Dog Dragon Swastik Lotus Kohia Hammer etc. The designs used for stenciling the brand on the drums and sometimes the colour of the drums differ so as to differentiate between the various brands and qualities.

The well known brands convey an assurance of quality but in the retail trade when the oil is mainly served out to customers loose in bottles or by gallon measures or by weight there is no proof that the oil being sold is of the brand or quality marked on the drum from which it is drawn. There is undoubtedly much scope for malpractices under these conditions.

(4) COMPARISON BETWEEN THE QUALITY OF BOILED OILS MANUFACTURED IN INDIA AND IMPORTED OILS

It has been found that imported linseed oil which is almost wholly of the boiled quality, particularly of one well known brand made in the United Kingdom was always fetching a higher price than similar types of linseed oil manufactured in India. Enquiries were made from various consumers which elicited the information that the higher price paid for the oil was based on the belief that it gave a more lasting and glossy film. In order to ascertain the precise quality factors which appeared to be responsible for the higher price paid for the imported product a number of samples of several brands of Indian manufactured oils and imported oils were physically

and chemically analysed, the results of which will be found in Appendix XLII. It will be seen from these results and is also borne out by enquiries that some of the Indian boiled oils are of a high quality and in no way inferior to any of the imported oils which not only failed to establish any point of superiority but failed also to come up to the specification laid down by the Indian Stores Department owing to an unusually high acid value. Consumers of such oil therefore pay more for an article which does not appear to be materially superior to the best Indian oils sold at somewhat cheaper rate. Goodwill and the fact that such oils had been established in the Indian market a long time before equally good oils were made in India along with the conservatism of the trade are probably the main factors responsible for the relatively high prices paid for the imported article.

Although imports of boiled oil into India from abroad have steadily dwindled the fact that imported oils are still found in the markets all over the country shows the popularity of these oils and possibly indicates that the Indian manufacturer is not sufficiently alive to the real needs of the consumer. Another factor which operates in favour of the imported oils is that boiled oils made by manufacturers in India often lack consistency and uniformity in quality. With the exception of a few well known brands the same brand of oil from the same manufacturer is not always found to be of identical quality.

(5) CONTAINERS

Linseed oil is put up in various kinds of containers for distribution. The more important of these are illustrated in the plates facing pages 218 and 219 and are described hereunder. It may be noted that the quantities of linseed oil transported in bulk in tank wagons forms an insignificant proportion of the total volume of traffic.

(a) *40/45 gallon heavy steel drums (with bands)*—This type of heavy steel drum holds about 400/420 lb of oil (or about 5 maunds and has a tare of 80/120 lb. The bands add considerably to the strength of this type of container and owing to its serviceableness over long periods these drums are largely used in the local trade at mulling centres. They are however not commonly used for the transportation of oil by railway owing to their heavy tare. The cost of these drums varies from Rs 5 to Rs 8 each second hand.

(b) *40/45 gallon light steel drums (without bands)*—These containers have the same capacity as the drums described above but being made of thinner metal sheets they are much lighter having a tare of only 45 to 60 lb. They have two corrugations circumferentially instead of separate bands. Such drums are largely imported into India carrying mineral oils. When emptied and cleaned they are much used for transporting vegetable oils by rail. Lately however the manufacture of these light welded steel drums has been taken up in India. The price for secondhand drums of this type is usually in the neighbourhood of Rs 3 to Rs 4 each.

(c) *5 gallon drums*—These are made both from black iron and galvanised iron sheets in a number of qualities the more expensive types being electrically welded. They are often fitted with destructible capsules to prevent the contents being tampered with. The cost of new drums varies from Re 0 12 0 to Re 1 9 0 each and the tare from 5 to 8 lb. Imports of linseed oil from abroad are packed in this type of drum.

(d) *4 gallon tins*—This is the ubiquitous kerosene oil tin found all over the country and may appropriately be called the universal container. Both new and second hand tins are very popular in the vegetable oil trade. The tare is about 2½ lb only and the capacity about 4 gallons or 18 seers. Their cost may be anything between Re 0 4 0 to Re 0 8 0 each, second hand.

(e) *1 gallon drums*—These are very similar to the 5 gallon drums already described and are used to a limited extent only. The tare of each drum is about 1 lb and the cost Re 0 6 0 to Re 0 9 0.

(f) *Suitability of different types of containers*—It will be clear that the different types of containers vary greatly in capacity and cost and are consequently adaptable to the requirements of different classes of consumers. While the 40/45 gallon drums are cheapest where large consignments are involved they must obviously be unsuitable for smaller quantities or where ease of handling is of primary importance. The 5 gallon drum is handy and strong but is comparatively costly. On the other hand the 4 gallon kerosene oil tins are much cheaper and can be stacked compactly but being made of thin tin sheets are more liable to damage.

Another factor of great importance in regard to containers which is closely linked up with the adulteration of vegetable oils is the degree of protection afforded against tampering with the contents. The 40/45 gallon drum has an arrangement whereby a wire can be passed through the bung and attached to the body of the drum and sealed. Thus the contents cannot be got at unless the seal is first broken. However, in most of the second hand drums used, it was found that the loop attached to the drum had been broken off and even when found intact, it was seldom availed of. Destructible capsules are generally fitted to the 5 and 1 gallon drums with the name of the manufacturer embossed thereon. This provides the consumer with an adequate guarantee in respect of the quality of the contents but the comparatively high cost of this type of container militates against its wider use for large quantities. The 4 gallon kerosene oil tin is closed merely by soldering on a disc so that tampering is possible without fear of detection.

Only a small proportion of the linseed oil consumed in India generally reaches the consumer in sealed containers and it appears that the importance of this matter is not realised to the full by a large section of the trade as well as by the buying public.

The general appearance and "get up" of the average container leaves much to be desired and the maxim that "a good product

requires a good container ' is not fully appreciated by a number of manufacturers. The fact that considerable quantities of boiled oil are served across the counter to small consumers mainly for painting purposes in nondescript bottles—frequently brought by the purchasers themselves—or by weight and that the user is almost invariably served with poor grade or "reduced" oils when buying from bulk, indicate that there would be a keen potential demand for a small cheap container in which linseed oil of guaranteed quality could be marketed without danger of being tampered with.

(6) DEMAND

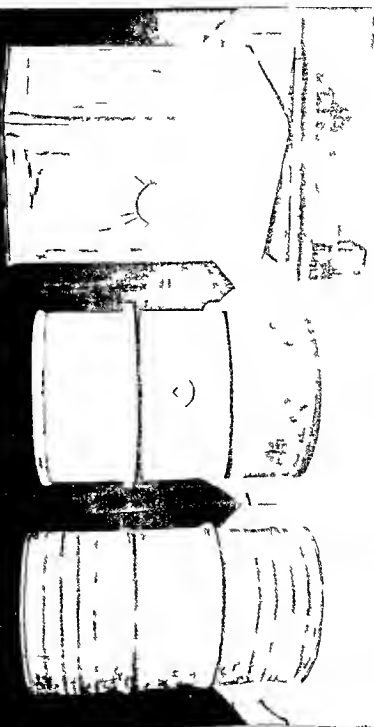
The demand for linseed oil in India is mainly internal. Apart from rather more than 400 tons or 100 000 gallons annually shipped to Burma exports to foreign destinations are very small averaging less than 300 tons or about 73 000 gallons. The internal demand falls under two heads (a) for industrial uses for which both raw and boiled oils are utilised, and (b) for human consumption for which raw oil only is used either pure or in admixture with other comparatively high priced edible oils such as mustard.

The demand for linseed oil for industrial purposes exists in every part of India whereas the edible trade is largely confined to certain areas only.

(a) *For industrial uses*—As an industrial oil linseed oil is consumed in India mainly in the preparation of paints and varnishes and to a comparatively small extent only in the preparation of printing inks oilcloth and water proof fabrics. Such requirements are met by the Indian production of boiled oil supplemented by small imports from abroad mainly from the United Kingdom (Chapter I page 30). The main consumers of linseed oil are therefore paint and varnish manufacturers the railways the Public Works Department the Military Authorities private engineering works including contractors and paint decorators. Purchases made for the State Railways and the Public Works Department and other official consumers are made through the Indian Stores Department while the supplies required by the military authorities are bought through the Director of Contracts at Army Headquarters. The detailed specifications which are laid down for such purchases differ very little from British standard specifications (See Appendix XLIV). These or very similar specifications are also adopted by other large consumers such as company owned railways paint and varnish manufacturers steamship companies etc.

The specifications for linseed oil describe the colour and general appearance of the oil and lay down the maximum tolerance as regards acid value the limits for saponification value and specific gravity together with minimum iodine value in the case of raw oil and the maximum drying time in the case of boiled oil.

Purchases of raw and boiled linseed oil effected by the Indian Stores Department during the past 5 years and the relationship of

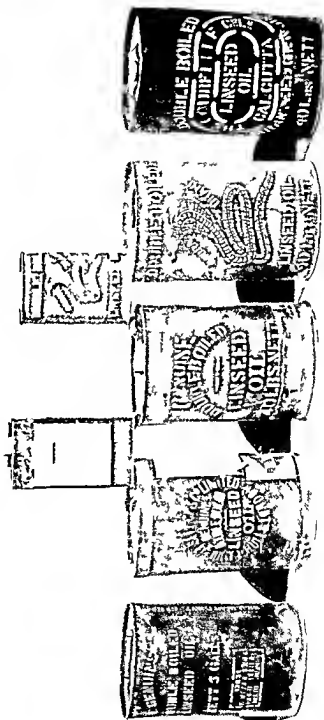


40 45 gallon drum
without bands

40 45 gallon drum
with bands

101 t n

Typical five gallon and one gallon drums used for Linseed oil



raw and boiled oils will be apparent from the following table —

Purchases of Linseed Oil by the Indian Stores Department

(In gallons*)

Year	Raw Linseed Oil	Boiled Linseed Oil	Total
1932-33	40,169	136,279	176 448
1933-34	31,862	122,948	154,810
1934-35	38,755	101 959	140 714
1935-36	74 655	131 001	205 656
1936-37	44,518	97 613	142,131

The consumption of linseed oil for industrial purposes tends to rise in the winter when painting activities are brisk.

(b) *For edible use*—The demand for human consumption varies greatly in different parts of India. Specifications which are a common feature in the industrial trade, are conspicuous by their absence in the edible oil trade.

As has been indicated in some detail in Chapter II, mustard oil is the most commonly used edible oil in the United Provinces, Bihar and Bengal and the fact that linseed and groundnut oils can both be mixed with mustard oil to a certain extent without appreciably changing the physical characteristics of the latter creates a demand for the two cheaper oils for the purpose of adulteration with mustard oil. The choice between groundnut and linseed oils obviously depends on their relative prices, the demand for linseed oil being greatest when the difference between the price of groundnut and linseed oil favours the latter and when both adulterants are sufficiently cheaper than mustard oil.

Linseed oil is the most widely used edible oil in the Central Provinces, and in Central India except in some of the northern districts adjacent to the United Provinces ghanu oil is considered superior and normally sells at a premium of about Re 1 to Re 1 8 0 per maund over mill manufactured oil i.e., nearly 10 per cent at current values.

In other provinces and States linseed oil, as such, is not used for human consumption.

The demand is lowest in summer and highest in the winter months stimulated by the increased consumption which takes place as a result

*The Indian Stores Department contracts reckon a gallon of raw oil to be 9½ lb and a gallon of boiled oil 9¼ lb.

of a number of important festivals such as *Durga Puja** and *Diwali*† which fall during this period. It should also be noted that there is a general increase in the consumption of all household necessities and even luxuries, on account of these festivals.

(7) PRICES

(a) *Relation of the prices of linseed oil, with those of linseed and linseed cake*—Linseed oil being the main product from the crushing of linseed one would expect a close relationship between their values. A comparison of the values of linseed and linseed oil shows that generally the prices of linseed oil at any given time depend but little on the current prices of linseed, so that the difference between the price of linseed and linseed oil varies considerably. The price obtainable for cake influences the price of oil but only to a small extent.

The average monthly prices paid by a mill at Calcutta for its purchases of linseed and obtained for its sales of linseed oil and linseed cake during three years are illustrated in the diagram facing this page. It will be observed that the difference between the price of linseed oil and linseed was as much as Rs 6 11 0 per maund in August 1934, and as little as Rs 3 5 0 per maund in June 1933. The difference between the average annual prices of the oil and linseed was Rs 5 8 11 per maund in 1933, Rs 4 3 6 in 1934 and Rs 4 11 1 per maund in 1935. The relation between the prices paid for linseed and those obtained for linseed oil and linseed cake by this mill during the three years will be clearly seen from the table below—

Relation between the prices paid for Linseed and obtained for Linseed Oil and Linseed Cake by a mill at Calcutta.

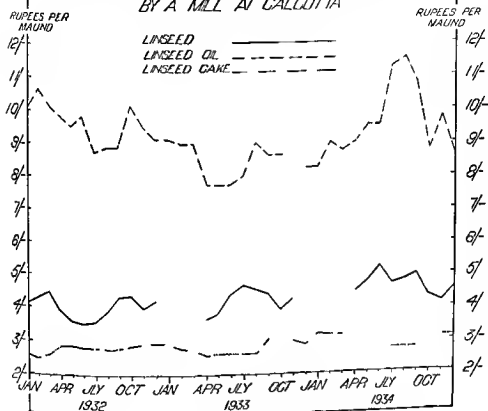
	Linseed	Linseed Oil (Raw)		Linseed cake (Hydraulic Press)	
	Average annual price	Average annual price	Per cent of linseed price	Average annual price	Per cent of linseed price
	Rs A P	Rs A P		Rs A P	
1932	4 0 8	9 9 7	237	2 12 4	68
1933	4 3 7	8 7 1	200	2 12 3	65
1934	4 10 7	9 8 8	204	2 15 6	63
Average	4 4 11	9 3 1	214	2 13 4	65

As 3 maunds of linseed yield approximately 1 maund of linseed oil and 2 maunds of linseed cake the difference between the total

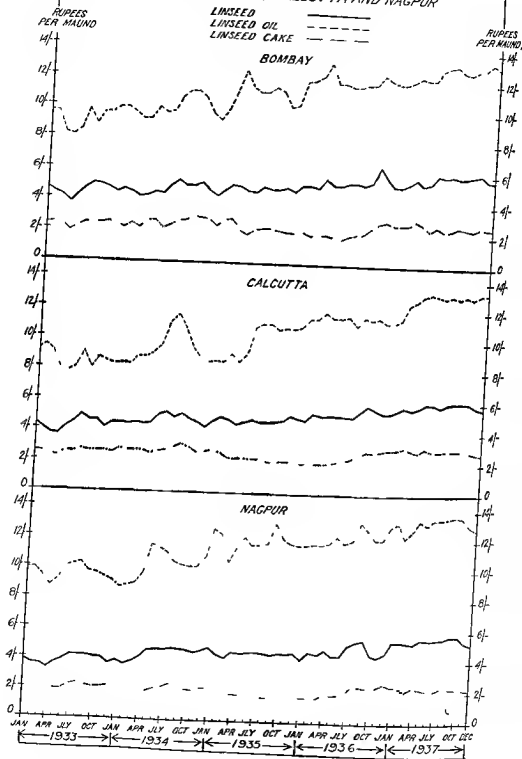
**Durga Puja*—worship of the goddess Durga—an important Hindu festival in the late autumn.

†*Diwali*—Literally, row of lights. A Hindu festival when illuminations take place on a large scale. It is usual for houses to be repainted before this festival takes place.

**AVERAGE MONTHLY PRICES PAID FOR LINSEED
AND REALISED FOR OIL & CAKE
BY A MILL AT CALCUTTA**



AVERAGE MONTHLY PRICES OF LINSEED LINSEED OIL AND CAKE AT BOMBAY, CALCUTTA AND NAGPUR



price of 1 maund oil and 2 maunds cake over the price of 3 maunds linseed at any given time represents the millers margin which includes his cost as well as profits. This will appear to vary widely at the current values of the three products and may actually show a loss on many occasions. For example, in August 1934, the price of 1 maund oil and 2 maunds cake exceeded the cost of 3 maunds linseed by Rs 2 7 0 but in June 1933 the price of 1 maund oil and 2 maunds cake was actually less by Re 0 6 0 than the cost of 3 maunds linseed at current values. It is evident, therefore, that the manufacturers do not base the prices of their products only on the current values of linseed. They buy linseed at different rates from time to time and in computing the cost of their oil and cake take their average price into account. The market conditions of course exert a big influence in the determination of selling prices. In the example taken the mill obtained at average annual rates for 1 maund of oil together with 2 maunds cake an amount which exceeded the price paid for 3 maunds of linseed by Rs 3 0 3 in 1933 Re 1 14 10 in 1934 and Re 1 7 11 in 1935, which is equal on an average to Re 0 10-4 per maund of linseed.

The average monthly wholesale prices of linseed linseed oil and linseed cake at Bombay, Calcutta and Nagpur are given in Appendices XLV to XLVII and illustrated in the diagram facing this page.

It will be observed that the relation between the prices of linseed, linseed oil and linseed cake varies from month to month and in different markets.

At Bombay the demand for linseed oil is mainly for industrial use. The demand for linseed cake and linseed is primarily for export. The prices of linseed and linseed cake follow generally the same trend but the price of oil often follows a different course for instance in February 1935 the price of oil had a sharp rise notwithstanding a slight fall in linseed prices. The annual average price of oil was more than double and the price of cake about half the price of linseed the actual prices and their relationship during the 5 years 1933-37 being as under—

Relation between Linseed, Linseed Oil and Linseed Cake prices at Bombay

	Linseed	Linseed Oil		Linseed cake	
	Average annual price (per maund)	Average annual price (per maund)	Per cent of linseed price	Average annual price (per maund)	Per cent of linseed price
1933	Rs. A P 4 7 6	Rs. A P 9 3 9	206	Rs. A P 2 4 11	51
1934	4 10 8	9 15 4	213	2 9 0	55
1935	4 13 8	11 3 10	231	2 2 3	44
1936	5 6 2	11 15 1	221	2 4 9	42
1937	5 12 6	12 12 9	221	2 2 9	38
Average	5 0 6	11 0 7	219	2 4 9	46

At Calcutta, the demand for oil is not only for industrial uses but there is frequently a greater demand for mixing and adulteration of other edible oils. The prices of oil therefore depend largely on the prices of other oils. The demand for cake is purely for export and that for linseed both internal and for export. The price at which millers sell their oil is somewhat lower at Bombay, whereas that obtained for cake is higher as will be seen from the table below —

Relation between Linseed, Linseed Oil and Linseed Cake prices at Calcutta

Year	Linseed	Linseed oil		Linseed cake	
	Average annual price (per maund)	Average annual price (per maund)	Per cent of linseed price	Average annual price (per maund)	Per cent of linseed price
1933	Rs 4 4 2	Rs 8 7 4	199	Rs 2 8 2	59
1934	4 10 5	9 6 0	202	2 11 10	59
1935	4 12 2	10 2 10	214	2 3 4	46
1936	5 5 10	11 7 4	214	2 8 2	47
1937	5 14 9	13 0 8	220	2 15 4	50
Average	4 15 10	10 8 0	210	2 9 4	52

At Nagpur, the demand for oil is mainly for edible use, for linseed and linseed cake there is an export as well as an internal demand. A closer relationship is observed between the price of linseed and oil than at Bombay and the oil fetches a relatively higher value as compared with Bombay and Calcutta. The relations between the prices of the three products at Nagpur is given in the following table —

Relation between Linseed Linseed Oil and Linseed Cake prices at Nagpur

Year	Linseed	Linseed oil		Linseed cake	
	Average annual price (per maund)	Average annual price (per maund)	Per cent of seed price	Average annual price (per maund)	Per cent of seed price
1933	Rs 3 13 0	Rs 9 9 11	252	Rs 2 1 7	55
1934	4 6 4	10 2 9	231	2 2 3	48
1935	4 8 5	11 14 5	262	1 12 4	39
1936	4 13 7	13 0 0	268	2 10 11	55
1937	5 1 7	12 12 0	250	2 3 10	47
Average	4 8 7	11 7 10	253	2 3 0	49

Thus the prices of linseed oil in these three markets averaged in different years from 199 to 268 per cent and the price of cake from 38 to 59 per cent of the price of linseed and it may be inferred that the price of linseed oil in different markets is considerably influenced by local conditions other than the price of linseed.

(b) *Seasonal variations*—The seasonal variations in the prices of linseed oil are not similar to those in linseed prices as will be seen from diagram facing page 224 which shows the percentage of monthly deviations from the annual mean at Bombay Calcutta and Nagpur. The percentage deviations in linseed and linseed cake prices are also illustrated in the same diagram for comparison. The lowest points at Bombay Calcutta and Nagpur are reached in April October and February respectively which do not coincide except at Bombay with the harvest decline in linseed prices. The prices appear at their highest level in June July and May at Bombay Calcutta and Nagpur respectively. This again is different from linseed where the peak is reached in August or September. The lack of uniformity in the seasonal variation in different markets lends further support to the inference drawn in the previous section that oil prices are influenced by conditions which are not related to the price of linseed.

(c) *Price variations in different markets*—The wholesale prices of raw linseed oil in 7 markets in different provinces of India are illustrated on diagram facing page 225. At first sight it would appear that the prices in different markets are all at sixes and sevens, but a closer examination of the graph indicates that although there is no close relationship between the prices in various markets values in some markets occasionally move in sympathy with those in certain others. For example the prices at Cawnpore and Patna show sympathetic movement from January to March and from June to August those at Nagpur and Wardha from January to August and those at Calcutta and Cawnpore from February to April and from September to November.

(d) *Price variations for different qualities*—The two chief qualities in which linseed oil is marketed are raw linseed oil and boiled linseed oil. The manufacturers reckon the cost of boiling from 9 pias to Re 0 2 0 per gallon and sell boiled oils from Re 0 1 0 to Re 0 2 0 per gallon over the price of their raw oil.

Raw oil is generally not put on the markets in a number of qualities. Nevertheless the oils from different mills are often sold at different rates in the same market. On the other hand boiled oil is put out by various manufacturers in a number of qualities usually distinguished by trade brands. These differ very considerably in price particularly owing to the fact that some of the brands are reduced oils.

The monthly average prices of a number of brands of linseed oil—both boiled and raw genuine and reduced—at Madras are

given in Appendix XLVIII, and the annual averages are summarised in the table below —

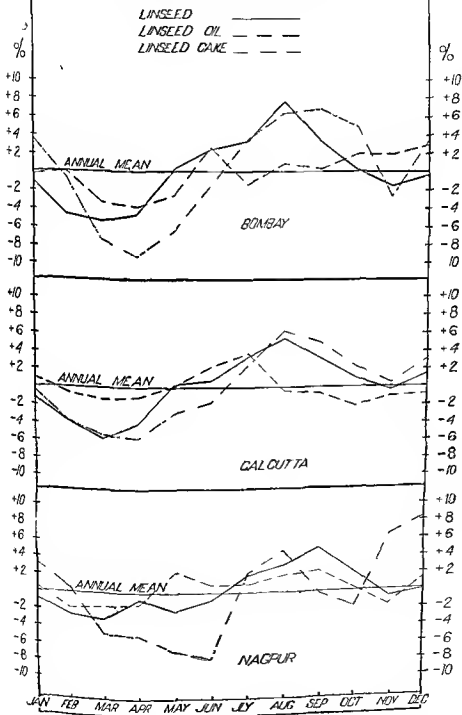
Annual average prices of various brands of Linseed Oil at Madras
(Per 5 gallon drum)

	1933	1934	1935
	Rs A P	Rs A P	Rs A P
Boiled oil—			
Brand A (imported)	13 3 10	13 10 6	13 5 6
„ B (made in Calcutta)	11 6 4	11 4 0	11 5 8
„ C (made in Calcutta)	11 6 4	11 4 0	11 5 8
„ D (made in Calcutta)	7 14 10	7 14 3	7 10 6
„ E (made in Calcutta)	7 11 6	7 11 1	7 14 0
„ F (made in Bombay)	10 4 8	10 6 2	10 3 6
„ G (made in Bombay)	6 8 0	6 4 0	7 0 0
„ H (made in Calcutta) Reduced	8 0 0	8 0 0	7 13 4
Raw oil—			
Brand B (made in Calcutta)	10 14 4	10 12 0	10 13 8

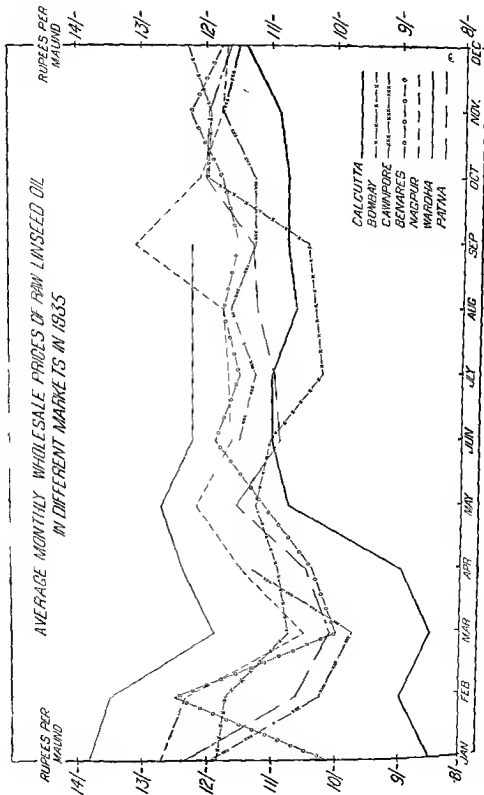
It will be observed that in 1933 the dearest and cheapest brands averaged Rs 13 3 10 and Rs 6 8 0 respectively per 5 gallon drum so that the cheapest brand was about 51 per cent lower in price than the dearest brand. In 1934 the prices of various brands averaged between Rs 13 10 6 and Rs 6 4 0 per 5 gallon drum showing a rise of Re 0 6-8 in the highest priced brand and a fall of Re 0 4 0 per 5 gallon drum in the cheapest brand. The cheapest brand was about 54 per cent less in price than the one which fetched the highest price. In 1935 the extreme limit of the averages for various brands were Rs 13 5 6 and Rs 7 per 5 gallon drum. The dearest brand lost by Re 0 5 0 per drum while the cheapest gained by Re 0 12 0 as compared with 1934 making the cheapest oil only 47 per cent lower than the dearest brand. The difference between the prices of various brands are governed not by the values of linseed oil only but also of mineral oils because as has been mentioned some of the brands—generally the cheapest—are not genuine linseed oil but mixtures of linseed oil and mineral oils.

(e) *Margin between wholesale and retail prices*—The wholesale and retail prices of linseed oil at Delhi and Amraoti are given in Appendices XLIX and L. It will be seen that while retail prices are always higher than the wholesale the margin between the two prices fluctuates considerably from year to year and from market

PERCENTAGE DEVIATIONS OF THE AVERAGE MONTHLY
PRICES OF LINSEED, LINSEED OIL & LINSEED CAKE
FROM THEIR ANNUAL MEAN



AVERAGE MONTHLY WHOLESALE PRICES OF RAW LINSEED OIL
IN DIFFERENT MARKETS IN 1935



to market. At Delhi, which is a consuming market only, the average annual margin varied between Rs 11 11 per maund in 1933 and Rs 113 4 per maund in 1936 as seen from the table below —

Margin between retail and wholesale prices of Raw Linseed Oil at Delhi
(Per maund)

—	1933	1934	1935	1936	1937	Average
	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P
Retail	11 15 4	12 4 8	13 15 5	13 1 7	14 13 5	13 3 8
Wholesale	10 13 5	10 14 4	12 6 4	12 4 3	13 0 2	11 14 1
Margin	1 1 11	1 6 4	1 9 1	0 13 4	1 13 3	1 5 1
Percentage of wholesale price	10 3	12 8	12 6	6 8	14 0	11 3

At Amraoti which is both a producing centre and a consuming market the margin was much lower, being between 46 and 81 per cent only of the wholesale price

Margin between retail and wholesale prices of Raw Linseed Oil at Amraoti
(Per maund)

—	1933	1934	1935	Average
	Rs A P	Rs A P	Rs A P	Rs A P
Retail	10 14 5	11 12 1	13 0 1	11 14 2
Wholesale	10 1 3	11 0 10	12 6 11	11 3 0
Margin	0 13 2	0 11 3	0 9 2	0 11 2
Percentage of wholesale price	8 1	6 3	4 6	6 3

The margin between wholesale and retail prices as obtained by mills is much lower. The average monthly wholesale and retail prices obtained by a mill in United Provinces show that the margin varied between Re 0 3 8 and Re 0 1 1 per maund, as given in the table below —

Average monthly wholesale and retail prices of Linseed Oil, realised by a mill in the United Provinces

(Per maund)

—	Wholesale	Retail	Margin.
	Rs A P	Rs A P	Rs A P
<i>1915</i>			
January	12 0 9	12 1 10	0 1 1
February	11 2 0	11 5 5	0 3 5
March	10 0 6	10 4 2	0 3 8
April	10 11 11	10 14 3	0 2 4
May	11 10 8	11 13 3	0 2 7
June	11 9 9	11 11 9	0 2 0
July	11 6 5	11 8 10	0 2 5
August	11 12 0	11 14 0	0 2 0
September	11 7 4	11 9 8	0 2 4
October	12 2 4	12 4 5	0 2 1
November	12 2 3	12 5 0	0 2 9
December	11 14 6	12 0 6	0 2 0
Average	11 8 0	11 10 5	0 2 5

The margin between the average annual wholesale and retail price amounted to Re 0 2 5 per maund or a little over 1 per cent of the wholesale price

On the other hand there is a considerable difference between wholesale and retail prices in the case of boiled oil particularly when sold in units of 5 gallon drums and when retailed in small quantities by weight or measure. The rates for two brands of oil taken at Delhi on one day for full drums and for loose sales, by weight as well as

measure are shown below and will indicate the price variations

	Petroleum per drum
<i>Brand A</i>	Rs A P
When sold per drum (45 lb net)	17 8 0
When sold per seer @ Re 1	20 8 0
When sold per Imperial gallon (9 lb) @ Rs 4	20 0 0
<i>Brand B</i>	
When sold per drum (40 lb net)	13 8 0
When sold per seer @ Re 12/	17 8 0
When sold per O.M. gallon (8 lb) @ Rs 3	15 0 0

(8) DISTRIBUTION

The oil turned out by the village *ghanis* is mainly consumed locally and is distributed through the village merchant or by the *teli* himself who sells it at the nearest market or in the village for cash or in exchange for linseed or other produce

On the other hand the oil manufactured by the mills and rotary *ghanis* finds its way into consumption—industrial and edible—through a more complex and widespread distributive system. The output of the United Provinces mills for example is not only marketed within the province but a large proportion is consigned to Bengal, the Punjab, Delhi, Rajputana, Central India and Bombay. The oil produced in Bihar largely moves to the adjacent provinces of Bengal and Assam. Some of the linseed oil manufactured in the Bombay Presidency also finds its way into Central India and the State of Hyderabad. Boiled oils of well known brands manufactured chiefly by the mills at Calcutta and Bombay are to be found all over the country.

(a) *Wholesale trade*—Manufacturers dispose of their oils in one of the following ways—

- (i) by sales to wholesale oil merchants either direct or through brokers
- (ii) by direct sales to large consumers such as railways, paint and varnish makers, engineering concerns and paint merchants
- (iii) by sales through commission agents
- (iv) through their own selling organisations

(*) *Sales to wholesale merchants*—The bulk of such sales generally consists of raw oil. Some of the mills employ guarantee

brokers or *banians** through whom all sales are made. These guarantee brokers are responsible for proper execution of contracts and for the full realisation of the price of the goods sold in return for which a commission is paid on sales. There does not appear to be any degree of uniformity in the scale of commission charges paid to brokers, the rates ranging from Re 0.20 per maund where the broker assumes little or no responsibility for the due fulfilment of sale contracts to Re 0.120 per maund where the risks carried by the broker are great or the services performed particularly comprehensive.

(ii) *Sales to large consumers direct*—Most of the large mills sell a fair proportion of their oil direct to important consumers. Tenders are competed for and if accepted contracts are entered into with the Indian Stores Department or directly with the railways and other public institutions, paint manufacturers, paint merchants, etc. Such contracts are generally for long term supplies extending over 6 months or a year, the mills undertaking to liquidate the contract by periodical consignments as required by consumers. Boiled oil forms the great bulk of sales made in this way.

(iii) *Sales through commission agents*—Some of the mills dispatch their product largely raw linseed oil to *arkhatiyas* at different stations for commission sale. The oil is sold by the commission agents in precisely the same way as has already been described in the chapter dealing with the assembling and distribution of linseed. All expenses incurred by the commission agent are debited to the consignor.

(iv) *Sales through their own selling organisations*—A few mills possess their own selling organisations in the shape of sole agents, sale depots or canvassers. The former are appointed to definite areas and distribute their principals' manufactures through sub-agents or other dealers. Mills' sale depots usually sell the oil direct to consumers on a cash basis but generally in quantities not less than 20 gallons at a time. Canvassers visit customers periodically in order to secure orders and to establish and maintain contact with the trade.

Whatever may be the agency employed for selling their oils, manufacturers base their selling prices on loose *ex mill* basis. Accordingly when linseed oil is supplied with containers the cost of the latter is added and when required to be delivered at the buyers' premises, the cost of transport is also added. Orders are also executed in return for keel drums if so desired, in which case the buyer is responsible for the expenses incurred in sending the drum back to the mill. No charge is as a rule made for the use of the drum and a deposit for its value may or may not be taken depending on the business relations existing between the parties concerned.

Most of the sales are made on credit terms, the period for which credit is allowed varying from 15 to 90 days in different centres. Interest usually at 6 to 9 per cent per annum is charged after the free period.

* A term much used in Bengal synonymous with broker. Often the *banian* is more than a broker combining the functions of a Shroff or financier.

The cost of distribution naturally varies according to the distance between origin and destination and the charges at the two points e.g. terminal tax transport to and from station, etc. The following is an actual statement of cost and expenses incurred on a consignment of oil railed from Cawnpore to Delhi:—

	Rs	A	P
35 drums of boiled linseed oil weighing 21 maunds 30 seers net @ Rs 8 10-0 per maund loose ex mill Cawnpore	187	9	6
Cost of drums @ Rs 1 each	35	0	0
Cartage and unloading at Cawnpore railway station @ 6 pies per drum	1	1	6
Octroi at Cawnpore @ Re 0 2 0 per maund	2	12	0
Incidental expenses at the station	0	4	0
Railway freight from Cawnpore to Delhi	13	10	0
Registered post charges on the railway receipt	0	5	3
Cost for Delhi	240	10	3
Station <i>dakali</i> (brokerage) at Delhi	0	4	0
Municipal terminal tax @ Re 0-1 0 per drum	2	3	0
Loading and cartage from station @ Re 0 1 0 per drum	2	3	0
Cost delivered at buyer's godown Delhi	245	4	3

Thus the expenses from the mill at Cawnpore to buyer's godown at Delhi amounted to Rs 57 10 9 or nearly 31 per cent of the prime cost of the oil.

(b) *Retail trade*—Raw linseed oil is retailed mainly by the *teli* or retailer of vegetable oils who usually sells a number of vegetable oils both edible and non edible under the same roof. The haphazard manner of keeping stocks adopted by retailers and the cleanliness of the premises occupied are far from satisfactory. The different oils are kept in tins of all sorts and conditions—open or closed—as well as in earthenware jars. The oils are weighed or measured into the buyer's own container the same ladle being indiscriminately used for serving different oils. Rates are usually quoted in seers per rupee or annas per seer.

Raw linseed oil for industrial uses is also retailed to a small extent by paint shops and hardware stores who sell the oil either by weight or by measure the seer and the ordinary quart bottle being the most commonly used unit.

In the case of boiled oils however the retail trade is almost entirely carried on by paint shops and hardware dealers, who also cater for the wholesale trade on the same premises. These oils are sold both by weight and measure the common units of sale by measure

being the 5 gallon drum, the gallon drum and the quart bottle. For sales in full drums the prices are inclusive of the containers whereas for sales of loose oil or for small quantities only, the container is almost always provided by the buyer himself. Oil imported from the United Kingdom is invariably sold in sealed 5 gallon drums.

There are considerable variations not only in the measures used in the linseed oil trade but in the weight of oil taken as the equivalent of a gallon. Graduated standard measures are unknown and anything from 8 to 9 lb may be regarded as equal to a gallon. The customary measure in the retail trade in boiled oils is the "old measure" (O M) gallon which is equivalent to about 8 lb of linseed oil by weight. At times however 9 lb may be given per gallon. Drums containing 40 lb, 45 lb or over 46 lb oil are all indiscriminately termed 5 gallon drums and it was found by test that drums purporting to be 5 gallon drums, were variously filled by the manufacturers with anything from 40 to 46½ lb net of oil. Raw linseed oil is usually sold on the basis of 9 lb to a gallon though upto 9½ lb may be given in different cases. The Imperial gallon it may be noted, weighs about 9½ lb of raw linseed oil and about 9½ lb of boiled linseed oil.

(9) ADULTERATION

In India, there is a demand for a cheap article in most commodities and vegetable oils are no exception to the general rule. This coupled with the absence of enactments penalising the mixing of different oils or the laxity of enforcement where such measures exist, permits adulteration to be carried on with impunity.

Mustard oil is held in high esteem as an edible oil in Northern India and is comparatively dear. The natural outcome of the demand for cheapness is that other lesser priced vegetable oils tend to be mixed with the dearer in such proportions as give the adulterator the greatest profit consistent with safety from detection. Unfortunately only the physical characteristics of the oil, e.g., its consistency, colour and smell, are apparent to the prospective customer, and therefore it is not possible to determine without a chemical examination in the laboratory whether any oil is adulterated unless adulteration has been carried to a point at which the physical characteristics of the original oil have been appreciably changed. Even this can to a large extent be overcome in the case of an oil possessing great pungency such as mustard oil. It is well known that unscrupulous dealers add synthetic mustard oil essence in the form of *allyl isothiocyanate* in order to impart the pungency associated with mustard oil.

The use of linseed and groundnut oils as alternative for adulteration with mustard oil has already been referred to elsewhere. It will suffice therefore to state here that the use of linseed oil for adulteration of mustard oil appears to be so prevalent that several mills handling large quantities of the latter, market their mustard oils in a number of qualities of which the first only is the genuine oil the others being mixtures of mustard and linseed oil in varying proportions. These lower grades are sometime given certain brands

or marks or may be designated by numbers such as No 1½ or No 1½ but are not called mustard oil by the manufacturers. Nevertheless these oils are passed off in the trade as mustard oil.

A number of commercial samples of mustard oil were collected during this survey and were analysed at the Harcourt Butler Technological Institute, Cawnpore. Of the 33 samples analysed 11 were found to be adulterated principally with linseed oil, the extent of adulteration varying from 33 to 100 per cent. This would indicate that at least one third of the so called mustard oil sold in India is adulterated. However the proportion is undoubtedly far greater in view of the fact that a fair number of the samples analysed came from the manufacturers before the oils had even entered the whole sale and retail trade where they lend themselves to further adulteration. It may be reasonable therefore to assume that more than half of the mustard oil as sold in the markets of India is not the genuine product.

It may be interesting to observe that a sample which had been given out with a guarantee of purity a reward of Rs 1,000 being offered to any body proving it to be otherwise, was found to be heavily adulterated with linseed oil.

While linseed oil finds an important outlet as an adulterant in other edible oils it is itself—both in the raw and boiled forms—liable to adulteration with white mineral oil, rosin oil etc. to meet the demand in the paint and varnish trade for a cheap oil. These adulterated oils are sometimes passed off as pure but more commonly sold as “reduced” oils in which case they are put on the market under trade marks or brands or under fancy names as “Superfine”, “Fine” etc. The nature and extent of adulteration is not stated on the container* and in the retail trade the average buyer does not know whether he is being served with genuine or “reduced” oil.

Out of 31 commercial samples of raw linseed oil collected during the course of this survey and examined at the Harcourt Butler Technological Institute, Cawnpore 10 were found to be adulterated, the main adulterants detected being rosin oil, safflower oil and mineral oil. Of the 10 samples found to be adulterated 6 purported to be genuine. Out of 32 samples of boiled oil analysed 12 were found to be adulterated, the chief adulterants being mineral oils, rosin and rosin oils. The extent of adulteration varied from 15 to 67 per cent.

Although legislation designed to prevent adulteration of food stuffs exists in most of the provinces in India and a number of municipalities have framed bye laws on the subject, the position with reference to vegetable oils appears to be far from satisfactory and the adulteration of vegetable oils is practised with impunity almost everywhere. The state of affairs at Calcutta regarding the adulteration of mustard oil may be cited as an instance. The Calcutta

*Oil imported into Burma containing more than 5 per cent impurities has to carry a suitable distinguishing mark such as “adulterated” or “reduced” under the Merchandise Marks Regulations. If the percentage of impurities exceeds 50 per cent the actual percentage of adulteration must be marked on the container.

Municipal Act 1923 makes it an offence to mix with foodstuff any substance which would reduce or lower or injuriously affect its quality or strength or diminish its food value or nutritive properties and prohibits the sale or manufacture of any food which is adulterated. The Act also provides that mustard oil shall be derived exclusively from mustard seed that every manufactory of mustard oil or other edible oil in Calcutta shall be registered and that no substance intended to be used for the adulteration of mustard oil shall be stored in any establishment manufacturing mustard oil. Notwithstanding these rules it is a matter of common knowledge that large quantities of linseed oil find their way into mustard oil at Calcutta when prices are suitable. Spasmodic attempts to check this adulteration appear to have been made from time to time. Samples are collected and analysed and prosecutions launched by the authorities concerned but determined and persistent action to stop this malpractice is conspicuous by its absence.

At Azamgarh a town of some importance in the United Provinces the municipal bye laws prohibit the sale of adulterated oils as genuine oils. Accordingly those traders dealing in adulterated oils avoid prosecution by placing a sign board or poster in their shops to signify that mixed oils are being sold. A copy of such a notice with an English translation is reproduced in the plates facing pages 244 and 245.

C—Linseed cake

(1) QUANTITIES PRODUCED AND QUALITIES

About 133 000 tons of linseed cake result from the annual crushing of nearly 200 000 tons of linseed in India. The essential differences in the cake produced by the various types of plant are those of physical appearance and oil content. The cake produced by hydraulic presses is in the form of rectangular slabs while expeller and *ghanis* cake is in fairly small pieces of irregular shape.

The value of oil cake as a fertiliser depends on the percentage of available nitrogen and as cattle food on the percentage of oil and albuminoids. Expeller cake as a rule contains the lowest proportion of oil and the cake from village *ghanis* the most. The amount of sand and insoluble matter in the cake depends on the extent to which the seed is cleaned before crushing. Being a valuable cattle food linseed cake is however rarely used as a fertiliser.

(2) DEMAND

Linseed cake produced by the village *ghanis* is all consumed locally for feeding cattle. The greater proportion of the rotary cake production is also now consumed within the country. On the other hand a small proportion only of the cake turned out by presses and expellers is consumed locally at or near the place of manufacture and the great bulk is exported abroad. The proportion of cake output retained in and exported from different areas has been discussed in Chapter II. The export demand for linseed cake on occasions influences the quantities of linseed crushed in India. When cake prices are favourable in Europe some of the mills which export

their cake output crush linseed to take advantage of these price conditions storing their oil for subsequent sale. When their oil storage capacity is filled crushing has necessarily to be curtailed.

(3) PRICES

The relation of linseed cake prices to linseed prices has already been discussed in an earlier section (see page 220) the average monthly wholesale prices at Bombay, Calcutta and Nagpur being given in Appendices XLV to XLVII and illustrated in Diagram facing page 221.

The seasonal variations in cake prices do not follow either linseed or linseed oil although at Calcutta some sympathy between the seasonal variations of linseed and linseed cake prices will be noticed.

The cake made by hydraulic presses fetches a higher price than expeller cake in the export trade as will be evident from the following table giving the prices of hydraulic press and expeller cake at Calcutta during 1936 and 1937. Only occasionally is expeller cake sold at a higher rate —

Comparison of prices of hydraulic press and expeller Linseed Cake

	Price of hydraulic press linseed cake per maund (ex wharf)		Price of expeller linseed cake per maund (ex wharf)	
	1936	1937	1936	1937
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January	2 8 6	2 8 9	2 1 0	3 2 0
February	2 7 6	2 11 0	2 0 0	3 0 0
March	2 5 8	2 10 6	2 1 0	2 14 0
April	2 5 3	2 8 6	2 3 0	3 2 0
May	2 7 6	3 3 0	2 4 0	2 15 0
June	2 5 6	3 4 9	2 6 0	2 15 0
July	2 5 3	2 15 6	2 10 0	3 0 0
August	2 5 9	3 4 0	2 14 0	3 0 0
September	2 6 6	2 11 9	2 13 0	3 0 0
October	2 11 6	3 5 3	2 14 0	2 15 0
November	2 10 0	3 3 6	3 0 0	2 13 0
December	2 9 3	3 4 6	3 0 0	2 12 0

(4) DISTRIBUTION

Linseed cake exported from India is generally sold under the contracts of the London Cattle Food Trade Association and the Hamburg Cattle Food Trade Association. The relevant extracts from these two contracts are given in Appendices LI and LII. Apart from the general terms and conditions of delivery, payment, arbitration, etc., specifications are laid down in respect of the minimum percentage of oil and albuminoids, the maximum tolerance for sand and the limits for rejection in case castor seed or husk is found present.

Oil and albuminoids are usually required to be not less than 33 or 40 per cent. The allowances for deficiencies under the guaranteed percentage are essentially the same in both the contracts, being 1 per cent of the contract price for the first 3 units or part thereof, 2 per cent for the 4th and 5th unit, and 3 per cent for each unit over 5. The free tolerance for sand is generally 2 to 2½ per cent, with an allowance of 1 per cent for each unit over the free tolerance, with buyers option to reject if the total proportion exceeds 5 per cent. The limits for rejection and the allowances made for the presence of castor seed or husk differ in the two Associations' contracts and are discussed in the following section.

Although the bulk of the linseed cake is exported with a specific guarantee of oil and albuminoids content the cake made by certain reputable mills is also shipped under the name of the mill, without any guarantee as to the percentage of oil and albuminoids. Such cake frequently sells at a premium in foreign markets. It should also be mentioned that a certain proportion of linseed cake is sold under an oil guarantee only.

The cake destined for the export trade passes into the hands of shippers at Calcutta, Bombay and Vizagapatam in much the same way as linseed itself. Shippers usually buy on the basis of their own contracts which generally follow the basis and scales of allowances laid down in the United Kingdom and Continental contracts mentioned earlier. The important difference however is in regard to the scale of allowances for castor seed or husk which are not only dissimilar to those of the export contracts but also vary between different shippers in India. The scale of allowances adopted by two shippers at Calcutta will show the extent of this variation.

Scales of allowances for castor seed or husk in Linseed Cake

As adopted by one firm	As adopted by another firm
Upto 004% free	001% 1 anna per maund
Above 004% upto 006% 1 anna per maund	002% 1½ annas per maund
Above 006% upto 008% 2 annas per maund	003% and 004% 2 annas per maund.
Above 008% to be rejected	Above 004% to be rejected

The other terms of the contracts will be clearly seen from a copy of an exporter's contract given in Appendix LIII.

It may be observed that linseed cake owing to dryage on storage and during transit shows a loss in its oil content. The shippers

therefore endeavour to keep about 1 per cent in hand between their buying basis in India and the selling basis abroad

The routine followed usually by exporters is similar to that employed when buying and taking delivery of linseed. At Calcutta for example, contracts are always made for delivery at the docks, preferably alongside the vessel. On arrival a number of hags—usually old but serviceable Heavy C gunnies—are opened and the goods are sampled by the buyer in the presence of the seller. The samples are placed in a tin, sealed and forwarded to one or other of the two or three firms of analysts in Calcutta. The determinations are made usually within 48 hours and the results communicated to the buyer. If the results satisfy the contract terms the cake is weighed over, paid for and shipped, but if the goods do not conform to any of the terms, the buyer charges an allowance or rejects the goods as the case may be.

Apart from the purchases made by exporters, the internal trade in linseed cake is not generally based on any specifications and the only quality factors normally taken into consideration are the general appearance and freshness of the cake. Only purchases made by the Military Authorities are on the basis of the specifications mentioned below —

To be made from the seeds of *Linum usitatissimum* and prepared by the hot press methods*

Water	Not more than 12%
Albuminoids	Not less than 26%
Fat (oil)	Not less than 9%
Digestible Carbohydrates	Not less than 30%
Woody fibre	Not less than 9%
Ash	Not less than 6%
Total food unit	Minimum 90 units (kellner)

The agencies concerned in the distribution of linseed cake for consumption in India are the mills the "tels" or operators of *ghanis* and the retail dealers of oil who deal in cake as well as in vegetable oils.

(5) PRESENCE OF CASTOR SEED AND HUSK IN LINSEED CAKE

Consignments of linseed cake exported from India have not infrequently been rejected or subjected to heavy penalties on account of the presence of castor seed or husk.

The London Cattle Food Trade Association contract requires linseed cake to be warranted free of castor seed and husk but the buyer is entitled to reject the goods only if the percentage of castor seed and/or castor husk exceeds 0.05 per cent. For propor-

*Linseed contains a cyanogenetic glucoside and an enzyme which in presence of water acts on the glucoside with the production of a poisonous substance. This enzyme is killed by heating the meal preparatory to pressing in hydraulic presses or expellers. In the crushing of linseed in village and rotary *ghanis*, although no preliminary heating is done, a sufficiently high temperature to kill the enzyme is developed by friction during the slow process of oil extraction.

tions below this tolerance an appropriate schedule of allowances is provided. The Hamburg Cattle Food Association contract on the other hand gives the buyer the option to reject even if traces of castor seed or husk be present although rejection is unusual so long as the percentage of castor seed and/or husk does not reach 02 per cent. The scale of allowances vary from 2 to 15 per cent depending on the proportion of this deleterious impurity up to an extreme tolerance of 05 per cent. The schedules of allowances laid down by the two associations are as follows —

Scale of allowances for castor seed and husk in export contracts for Linseed Cake

Proportion of castor seed and/ or husk not exceeding	Allowances	
	London contract	Hamburg contract
001%	2 sh 6d per ton	2% of the contract price
002%	3 sh 9d per ton	2% , ,
003%	5 sh 0d per ton	2½% , ,
008%	(Reject over 003%)	3½% , ,
02%		4½% , ,
05%		5½% " or reject ,
08%		7½% , ,
10%		9% , ,
25%		11% " , ,
50%		15% , ,

A specific condition in both these contracts is that the analysis of the samples for determining the presence and proportion of castor seed must only be done by the analysts mentioned in the contracts.

It will be observed that the limits of rejection adopted by the exporters for their purchases in India are somewhat different from the London and Hamburg Association contracts. For example as has been referred to earlier one large exporter rejects linseed cake if castor seed and/or husk exceeds 008 per cent while another rejects for any excess over 004 per cent only.

It may be inferred from the varying bases on which purchases are made in India and sales effected in Europe that the castor seed test is by no means infallible nor the results obtained truly indicative of the quality of the whole of the parcel concerned.

Contamination with castor seed or husk as has been mentioned in an earlier chapter may conceivably be caused by one or other of several factors e.g. from castor seed plants growing wild or some times cultivated on the boundaries of linseed fields or through inadvertence in the mills in which castor seed as well as linseed and other oilseeds are regularly crushed or again by the use of second hand bags which may have been used to carry castor seed. One large mill in Bengal crushing linseed exclusively and drawing its linseed supplies from the United Provinces and Bihar found one or two odd beans on very rare occasions only and then only in lots of hundreds of tons. Another large mill also crushing linseed stated that only once in ten years had a penalty been incurred on a consignment of cake exported to England and never having crushed any castor seed before or since the alleged presence of this deleterious oilseed could not possibly be accounted for. Information obtained from the mills in the United Provinces indicated that castor seed and husk were found rather more frequently in their consignments of cake exported. Some of these mills crush both linseed and castor seed but it has been asserted that the presence of castor seed was reported in certain consignments in which the most scrupulous care was taken to avoid any admixture of this kind and that the same cake sold in India for local consumption had been freely given to cattle without any injurious effects whatever.

It appears therefore that the method of detecting the presence of castor seed as applied to linseed cake is open to some objection. The principle of the method normally employed is for a quantity of powdered cake to be treated with hydrochloric acid. By this means the seed coat of the linseed is bleached while such portions of the husk or testa of the castor seed as are present remain as dark brown angular fragments which appear black in water and are easily recognisable under the microscope. Samples of linseed in the United Provinces and Bihar may at times be found to contain several types of wild seeds one such being known as *katehi* seed a small black seed known botanically as *Solanum Xanthocarpum*. If the colour of this particular seed is not bleached by the hydrochloric acid treatment its presence may easily be mistaken for castor seed. No scientific work appears to have been done to see how far—if at all—these various seeds would differ in appearance from castor seed after bleaching. It appears therefore that while every effort should be made to prevent the admixture of castor seed with other oilseeds in the field as well as in the mill the possibilities of other seeds found mixed with Indian linseed being mistaken for castor seed should not be lost sight of.

(6) MANUFACTURERS' ASSOCIATIONS

There are no institutions exclusively concerned with the linseed crushing industry in India. In the United Provinces an association was established in 1934 styled the United Provinces Oil Millers Association. The Association is formed under Section 26 of the Indian Companies Act, so that the income and property of the association may be applied solely towards promoting the objects of the association. The membership of the association is open to any firm individual com

pany or corporation engaged in the oil crushing and allied industries. The objects of the association in general are to promote and protect the oil crushing and allied industries in the United Provinces, to settle disputes arising out of trade dealings and commercial transactions and to establish just and equitable principles in the oil and allied products trade. In Bengal there is an association called the Calcutta Oil Mills Association but its membership is confined mostly to the mills crushing seed by rotary *ghants*. There are at present no active associations in the Central Provinces, Bihar and Bombay.

D—Railway freight on linseed oil and cake as compared with that on linseed

Although small quantities of linseed oil and cake are transported by road and river the bulk of the movement in these commodities takes place by rail and as such railway freights have an important bearing not only on the movement of linseed oil and cake but indirectly on the linseed crushing industry.

As has been indicated in Chapter VIII linseed is placed in Class I for the purposes of calculating railway freight, which is 38 pies per maund per mile. Linseed cake also falls in the same class but linseed oil is placed in Class 4 for which the ordinary rate is 62 pies per maund per mile. Schedule rates which are lower than class rates have been allowed on certain railways for linseed oil and cake. For example the schedule rate for linseed cake on the Bengal Nagpur, East Indian and Great Indian Peninsula Railways is as low as 1 pie per maund per mile when booked in minimum wagon loads of 300 maunds at owners' risk.

Specially low rates *viz.* station to station rates are allowed between certain points depending on the volume of traffic. A few specimens of station to station rates for linseed oil and cake are given in the table below together with the calculated schedule and class rates for comparison —

From	To	Railway system	Distance (miles)	Station to station rates	Calculated at schedule rates	Calculated at class rates
<i>Linseed Oil</i>				Rs. A. P.	Rs. A. P.	Rs. A. P.
Cawnpore	Howrah	E. I.	630	0 14 11		1 6 11
Aligarh	Howrah	E. I.	823	1 3 0		1 12 10
Aligarh	Patna	E. I.	485	0 14 6		1 1 0
Patna	Howrah	E. I.	338	0 10 9		0 11 10
Bombay	Madras (via)	G. I. P.	443	} 0 15 7		1 11 0
	Raichur	M. & S. M.	351			
<i>Linseed cake</i>						
Nagpur	Bombay	G. I. P.	520	0 5 4	0 4 4*	1 0 6
Nagpur	Vizagapatnam	B. N.	516	0 5 2	0 4 4*	1 0 4

*Only for minimum wagon loads of 300 maunds

As three maunds of linseed yield approximately one maund of oil and two maunds of cake the relative advantage of despatching unseed oil or linseed from a producing area would depend on whether the freight on three maunds of linseed is greater or less than the combined freights on one maund of oil and two maunds of cake together. If however a local demand exists for linseed cake the saving of freight on cake would offer some additional incentive favouring the despatch of the oil. For example the freight on 3 maunds of linseed between Nagpur and Bombay at the station to station rate of Re 0 8 5 per maund amounts to Re 1 9 3 while the freight on 1 maund of linseed oil at Re 1 3 6 per maund and 2 maunds of linseed cake at the schedule rate of Re 0-4-4 per maund for full wagon loads, total up to Re 1 12 2. Thus it is advantageous for Bombay to buy linseed and crush it locally rather than purchase linseed oil.

As nearly half of the linseed produced in India and more than three-fourths of the total quantities put on rail are eventually despatched to the ports for shipment abroad, the railways have provided cheap station to station rates for linseed from a number of stations in the producing areas to the ports in order to encourage this traffic. These cheap rates of freight have helped the development of the linseed crushing industry at the ports particularly as almost the whole of the cake is exported abroad.

INTER-CHAPTER TEN

The linseed crushing industry has shown striking progress in the last quarter of a century. Prior to that time less than 10 per cent of the total crop was retained but on the average of the past three years over 40 per cent and in 1936-37 over half of the total production has been used in India for the manufacture of oil and cake.

There are still thousands of old-fashioned village *ghanis* in use although the number has shown a tendency to decrease in recent years as the large power mills increased. The rotary *ghani* is a comparatively crude piece of mechanism but it would be a mistake to judge the efficiency of the village *ghani* on a strict costing basis. It would in any case be difficult as the *teli* and his family all work at the *ghani* at odd times and their labour cannot be assessed in terms of cash with any degree of accuracy. Apart from any advantages inherent *per se* in a cottage industry, two important points stand out in favour of the *ghani* system. In the first place the oil so produced sells for edible purposes at a premium of as much as Re 1 per maund above oil made in the large power mills. Further, where the *ghanis* are found closely associated with linseed production they offer a regular outlet for the growers' linseed and it is observed that the seasonal fluctuation in prices and the depression in prices at harvest time is less where they exist than in those other producing areas which are entirely dependent on the export market or distant industrial crushing centres. There is therefore much to be said for encouraging the crushing by *ghanis* in the producing areas, but in order to put them in a better position to compete, it is desirable that some efforts should be made to get rid of the crudities of the old-fashioned equipment at present in use. The depart

ments concerned might with advantage devote some attention to this point

The number of large power driven oil mills in India has increased rapidly in recent years and at least 123 are now engaged wholly or partially in the crushing of linseed. No official statistics, however, are available regarding the quantities of the different oilseeds crushed by these mills or even of their crushing capacity, and it is desirable that some more up to date census should be made and regular returns obtained from these establishments. These large mills are equipped with different types of plant. Some, for example, consist of batteries of rotary *ghanis* working on the old fashioned mortar and pestle system, others have installed hydraulic presses in which the cooked meal is pressed between plates and the cake residue comes out in the form of rectangular slabs, and others are equipped with expellers consisting of steel worm screws which revolve within a cage so as to produce gradually increasing pressure on the oilseeds to drive out the oil. The residue in this case is forced out in broken, irregular pieces similar to *ghani* cake. It appears that the expeller system is growing rapidly in favour.

The total quantity of linseed crushed by *ghanis* and power driven mills during the last three years has averaged about two lakhs tons. The yield of oil obtained under commercial conditions from linseed as received by the mills, i.e., including the impurities, is about 33 per cent from Small linseed and upto 36 per cent from Bold, the yield in village *ghanis* is, however, considerably less and varies from 25 to 30 per cent only. The cost of crushing appears to vary from Re 0 6 0 to Re 1 4-0 per maund of linseed, or Re 1 to Rs 3 8 0 per maund of oil, but the millers' margin, which includes profit as well as the working cost, varies widely

and at times, the price of three maunds of linseed shows an apparent loss as compared with the price of the resultant products, viz, one maund of oil and 2 maunds of cake. The millers' margin appears to vary from year to year. In the case of one mill, for example, it was over Rs 3 in 1933 but less than half this amount in the following two years. It would in fact appear, that there is very little relation between the price of linseed, linseed oil and linseed cake. The oil generally sells about $2\frac{1}{2}$ times the price of linseed and the cake about half the price, but different markets vary in this respect. At Calcutta, for example the price of cake is relatively high and that of oil low. At Nagpur on the other hand where the oil is mainly for edible use the price is relatively high.

The quality of linseed oil varies enormously according to the method of production and subsequent treatment. Oil produced in the village *ghanis* does not receive any treatment and is consequently not as clear as the oil turned out by the large mills where it is usually filtered or put in a tank for sometime to allow the mucilage and suspended foreign matter to settle. The colour of linseed oil depends largely on the temperature and method of extraction. Oil produced by expellers is generally paler than that manufactured in other types of plant. Apart from these small differences in physical characteristics there appears to be little or no appreciable chemical differences between raw linseed oil as prepared by modern machinery and that turned out by the village *ghani*. For edible purposes oil produced by the village *ghani* is considered to be sweeter and to have a better flavour than mill made oil. There is, however, no clearly understood standard of quality. For industrial purposes clear bright oil with good drying properties is generally preferred. "Boiled" linseed oil differs from "raw" oil in having added to it, "driers" usually in the form of salts of lead, manganese

and cobalt, which are believed to act as catalysts in helping the oil to absorb oxygen and to form quickly a firm and elastic film when used in paints, varnishes, etc. It is probable that only about 15 per cent of the linseed oil manufactured in India is sold as "boiled" oil and the production of this type is confined mainly to large mills in Calcutta, Bombay and Cawnpore.

Almost all the imported linseed oil is of the "boiled" type and chemical and physical tests of these imported oils show that although they are very popular and command a relatively high price they are in fact no better—and in some respects not so good—as the good class Indian "boiled" oils. These imported oils command a good price on the market owing to their high reputation and also to the fact that they are as a rule sold in sealed containers. This indicates that there is much need for the Indian oil industry to devise systematic standards for the various kinds of products and to put them on the market in containers which cannot be tampered with until they have reached the final purchaser.

There is an enormous range in the price of linseed oils, some of which sell at half the price of others. Apart from pure linseed oil there is found on the market a large number of "reduced" oils which in some cases purport to be linseed oil and in others are termed merely "paint oils". These are mixtures of mineral oils, rosin etc., alone or with linseed oil. In the absence of any well defined standard and system of marking the pure linseed oils, these reduced oils tend to lower the price of the pure product, and manufacturers feel compelled to put out brands which can successfully compete.

An analysis of some commercial samples of raw linseed oil showed that about one third were adulterated,

mainly with rosin and mineral oil, and that two-thirds of the adulterated samples purported to be genuine. Similarly in the case of boiled oils, more than one third were adulterated and the extent of adulteration varied from 15 to 67 per cent. The adulteration of industrial products is not covered by the normal provincial legislation which deals mainly with the adulteration of foods and drugs. As the common law would appeal to offer very little chance of redress, it seems that so far as industrial oils are concerned, the adoption of a standard quality specification and system of marking by all reputable firms, would be the first step towards solving the adulteration problem. As this would not altogether eliminate secondary adulteration by retailers, it would be desirable at the same time to pay increased attention to the adoption of small conveniently sized containers, on which the seals would remain intact until the product reached the hands of the consumer.

Attention has already been drawn to the adulteration of edible oils such as mustard oil with linseed and groundnut oil. Out of 33 samples of mustard oil analysed in the course of this survey, 11 were found to be adulterated probably with linseed oil to the extent of 33 to 100 per cent. It is known also that some irresponsible people go so far as to add *allyl isothiocyanate* to linseed oil in order to give it the characteristic pungency of mustard oil.

This question of adulteration is serious. It has already been mentioned that the enormous quantity of linseed oil used for adulteration of other edible oils imparts a certain amount of elasticity to the local demand and to supplies available for export. To that extent the practice may be regarded as advantageous from the producers point of view, but this must not be used as an

Replica of a signboard put up outside an Oil Merchant's shop in Azamgarh (United Provinces)

हमारे यहाँ
मिलावटी तेल (मफड़ा) बिकता है

नाश्वसालिक

نام مالک
محیط ابھارا
کابل

(See reverse for translation in English)

Translation of a signboard at an Oil Merchant's shop in Azamgarh

MIXED OIL IS SOLD AT OUR PLACE.

Name of Owner... ..

argument in favour of the adulteration of edible oils since the market for pure linseed oil is, on the other hand, very much contracted by the practice of adulterating linseed oil sold for industrial purposes. The market so lost is probably greater than that gained through the use of linseed oil as an adulterant of other edible oils.

There is a tendency for those responsible for the administration of food adulteration acts and regulations to adopt an attitude of resignation in the face of the various tricks to which sellers resort in order to elude the regulations. In cases where municipal authorities take steps to prohibit the sale of adulterated oils as genuine, a simple device adopted by traders to avoid prosecution is to place a signboard or poster in their shop to signify that mixed oils are being sold. If the authorities were seriously concerned in prohibiting the sale of adulterated products such a move might be encountered in various ways. As a beginning it would be desirable to prohibit sellers of edible oils from selling non edible oils used for industrial purposes and those purporting to trade in mixed oils from selling pure oils either edible or non edible. A system of licensing and a graduated scale of licence fees for dealers might be so arranged that those who wish to make enhanced profits from selling mixed or adulterated oils would contribute at a higher rate to the common good.

So far as the distribution of linseed products is concerned some attention needs to be directed to the development of an export trade for Indian made linseed oil, particularly in the countries bordering on the Indian and Pacific Oceans. Indian linseed oils, both raw and boiled, are of a high quality capable of competing on the world markets, but as a first step, it would be essential that the manufacturers as a body should adopt standard specifications and

systematic marking of export oils, so that foreign buyers could make their purchases with absolute confidence. Given this were done, there seems no reason why the export trade and the milling industry in this country should not show a rapid expansion. At present however there are only one or two minor manufacturers' associations in existence whose interests appear to be mainly concerned with local affairs and there is some need for a representative all India body to be constituted.

So far as the distribution of linseed cake is concerned it is to be hoped that in the near future the development of the dairying and animal husbandry industry in India will create a wider market for this product at reasonable prices so as to avoid the excessive dependence of manufacturers on the export market. At present some of the larger exporters in this country and buyers abroad, particularly in the United Kingdom, appear to work on the assumption that manufacturers in India are totally irresponsible in the matter of quality and particularly in regard to the presence of castor seed husk in the cake. It is not surprising if, on the other hand, manufacturers here who have taken extra care in the matter, consider that this factor is often used as an excuse by the buyers abroad for squeezing a little extra profit. There is, it would appear some justification for this belief as the methods of analysis for identifying castor seed husk are not by any means fool proof since other kinds of wild seeds which may be present as impurities, *e.g.*, *kateli* seed, appear to give similar reactions. This is a matter for investigation and negotiation which could more appropriately be taken up by some body fully representative of linseed crushers in India.

Before leaving the question of distribution of linseed products it may perhaps be noted that railway

freights, which are generally favourable so far as linseed for export is concerned, are not quite so advantageous when considered in relation to the rates on linseed oil and linseed cake respectively. It is worth consideration whether a lower freight on oil, especially if tank wagons could be used, would not encourage greater crushing of linseed upcountry and larger shipments of oil to the ports both for industrial uses and for export to neighbouring countries.

CHAPTER XI—SEED.

A.—Supplies.

(1) QUANTITIES

The seed required for sowing varies from 10 to 25 lb per acre in different parts of India. The average seed rate, as reported by different provinces and States, is tabulated below—

	Average seed rate per acre lb	Acreage (Average 1934 35— 1936 37) (000 Acres)	Seed required for sow ing (000 lb)
Assam	14	6	84
Bengal	21	118	2,478
Bihar (and Orissa)	12	569	6,828
Bombay and States	13	120	1,560
Central Provinces and States	14	1,216	17,024
Central India States and Gwahar	14	376	5,264
Hyderabad	10	431	4,310
Kashmir	21	27	567
Madras	12	2	24
Punjab and States	16	30	480
Rajputana	20	149	2,980
United Provinces and States	20	874	17,480
Others (North West Frontier Province, Burma, etc)	15	1	15
Total		3,919	59,094

Taking the respective areas under linseed into consideration, the average seed rate for British India and Indian States works out at 15 lb per acre. The average acreage for the last 3 crops being 3,919,000 acres the quantity of seed normally required for sowing in the country at this rate would be about 26,000 tons.

(2) SOURCES

The cultivator generally sets aside enough linseed for his sowing requirements immediately after the crop is harvested and threshed. However, at times, when hard pressed for cash, he also sells the whole of the harvest either at once or later as necessity demands. In such cases or when a producer has no seed or not enough seed

he obtains his requirements by either borrowing or buying from another cultivator, a village merchant or from a commission agent

In the Central Provinces United Provinces, Bihar and Orissa, the seed is usually obtained on the *sawai* system, meaning, that on repayment the quantity borrowed is to be returned with an addition of 25 per cent. In some of the eastern districts of the United Provinces however and in some parts of the Central Provinces the system prevailing is known as *deorhi*, implying the repayment of the original loan *plus* an additional 50 per cent. Such transactions are mostly in kind, but when cash is involved the same additions of 25 and 50 per cent are made to the value of the seed at the time of repayment. As the interval between the borrowing of seed (August—October) and the harvesting of the crop (February—April) is about 6 months *sawai* and *deorhi* system imply a rate of interest amounting to 50 per cent and 100 per cent per annum respectively. In cash transactions it has also been found that in some parts of the United Provinces (*eg*, in the Jalaun district) the cash value of the seed advanced was reckoned by the village merchant at the rate of 1 seer per rupee less than the current market rate while at the time of returning the seed it was recovered from the debtor at the rate of 1 seer per rupee higher than the current rate. Thus the borrower lost both ways *ie*, by one seer per rupee at the time of borrowing and another one seer per rupee when he returned the seed. If the seed is not returned or the repayment not made immediately after the harvest another 25 per cent calculated on the total *sawai* amount of the previous year is added for repayment in the following year.

The *sawai* system is also largely prevalent in Central India and Rajputana States.

In the Bombay Presidency about two thirds of the cultivators appear to retain their own seed for sowing and the rest purchase what they require either on cash or credit from commission agents or *sahukars*. For advances of seed on credit the local commission agents charge interest from 12 to 18 per cent on the value of the seed while some *sahukars* charge in kind recovering one and a half to double the quantity of seed originally lent.

In Bengal and Assam as well as the Punjab the main source of the cultivator's seed supply is the seed stored by himself but it may be supplemented by borrowing or purchasing from other cultivators or from village merchants as and when necessary.

(3) DISTRIBUTION

The distribution of linseed for seed purposes as above stated, is mainly undertaken by village merchants *sahukars* and cultivators. They either retain sufficient linseed out of their own produce or collect from others at harvest and offer it for sale at sowing time. There are no seed merchants in the real sense of the word.

Other distributing agencies for seed are the Government agricultural farms and seed stores in the different provinces and States.

but the quantities distributed in this manner are still so insignificant that the amount of seed does not appear in the majority of the annual reports issued by the various provincial Departments of Agriculture. The only two exceptions appear to be the Agricultural Departments in Bengal and Bihar. In the former area the total amount of seed, presumably pure, issued by the Department in 1934-35 amounted to about 53 maunds only. In the following year only about 7 maunds were distributed. In Bihar, one of the most important producing tracts in the country, the amount of seed distributed in 1934-35 and 1935-36 was less than 4 maunds. From the two instances quoted it will be clear that a good deal remains to be done in the way of providing the cultivator with good pedigree seed.

The methods of seed distribution adopted by the Agricultural Departments are much about the same in the different provinces. In the United Provinces for example, the seed is issued from the seed stores or from the agricultural farms either on cash payment at a price which is about 10 per cent higher than that of the local desi varieties, or on credit on the usual *sauat* conditions.

B—Control of Supply of Pure Linseed

While considerable research work has been done in evolving better yielding and disease resisting varieties of linseed there appears to be little control over the supply of seed, pure or otherwise. One or two isolated attempts appear to have been made to improve the quality of the crop grown, as for instance in 1935 when the Department of Agriculture in the United Provinces arranged to give special grants in aid amounting to Rs 3 per acre or alternatively a remission of half the land rent, whichever was less, for sowing linseed on approved plots selected for the purpose.

In the Central Provinces, it has been reported that no control is exercised over the supply and the variety of seed sown by producers as the Government farms are not in a position to supply growers with any appreciable quantities of improved types. In the United Provinces a similar state of affairs may be said to exist in general regarding the control of the quality of seed used by cultivators and a like situation obtains in Bihar, in Orissa, in Bengal and in the Bombay Presidency. In each of these provinces the producer sows whatever seed he can save out of his produce or obtain from merchants *sahukars* or fellow cultivators.

C—Seed Growers' Associations

The reports from various provinces indicate that there are no seed growers' associations.

D—Quality considerations

The economic value of any variety of linseed depends on the percentage of oil in the seed together with the yield obtained per acre, or in other words the oil per acre. High yields are obtained only if the variety is suitable to the soil and climatic conditions of the locality where it is grown. The quality aspect is, however, not

taken into account by producers who generally sow whatever seed happens to be available. Cultivators who grow linseed year after year do not generally change their seed.

As a rule the small type of linseed which is lower in oil content than the bold gives a higher yield per acre. In the Central Provinces however the size of the seed becomes larger progressively from the east to the west of the province and the yield per acre also increases. It is also reported from the Bombay Presidency and from the Punjab where incidentally only small linseed is in general cultivation that the yield is higher from the large grained types. In such areas there is no object in extending the cultivation of the small seeded types of low oil content*.

It was observed that little or no care is taken to clean the seed preparatory to sowing in order to free it from mixtures of wheat and gram. Instances were also noticed in Bihar and Orissa in which the linseed was sown amongst the standing rice crop.

E—Research Work

As has already been mentioned the linseed plant in India is grown entirely for the oilseed and not for the production of fibre. The possibilities of combining the production of linseed with that of flax and the establishment of a fibre industry have been the subject of numerous experiments in India. Seed specially imported from Europe has been employed in flax trials and in many cases a satisfactory fibre obtained. But various difficulties such as the necessity for storage and retting and for importing fresh seed for sowing at frequent intervals place the cultivation of flax far beyond the means of the ordinary grower. Its cultivation has therefore made no progress in India and subsequent research work has been directed towards improving the quality of linseed and the yield per unit.

Pusa—Various commercial samples of linseed from different parts of India were collected and examined at the Agricultural Research Institute Pusa where they were sown in 1915. The elementary species were isolated and classified after several years of successive sowing. The oil content and size of the seed were found to vary in these different types. They were also found to be suitable for different soil conditions. Those with a deep root system were best for the soil conditions in Peninsular India while the plants with a shallow and abundant root system were suited to the Gangetic alluvium. The former types yielded a relatively small number of bold seed with a high percentage of oil and the latter more abundantly of seed which is generally small in size and comparatively poorer in oil content. Of the latter Types 12 and 121 were found to be high yielding and were distributed to growers. Experiments were continued with a view to produce bold seeded

*The 'drying' value of the oil from the seed is another important consideration but very little work has been done in this connection.

types giving a high yield of seed. Some of the best of the small seeded types (of which Types 12 and 121 have just been mentioned) were crossed with several of the bold seeded types. The inheritance of characters was studied*, and about 80 hybrids were isolated from these crosses and the most promising types tested for yield and oil content. Some of these hybrids are about equal in yielding power to the small seeded Types 12 and 121 and are being tried out in the provinces. The results of crosses between rust resistant and rust susceptible types are under investigation and some Australian types are also being tried. There were also some indications of a correlation between seed colour and oil content. The yellow seeded types possessed the highest oil content, this factor decreasing as the seeds grew darker in colour.

The position in regard to the research work undertaken in the main linseed growing provinces may be briefly summarised as follows —

Central Provinces—Experiments have been in progress for a number of years to hybridise and select heavy yielding rust resistant and early maturing types of bold linseed. E B 3 linseed is an early maturing type which generally escapes rust and is regarded as the local standard. Crosses between local linseed and rust resistant Pusa varieties are under trial on an experimental farm. The progeny are said to be rust resistant.

United Provinces—The Research Section of the Department of Agriculture has evolved many new varieties of linseed. Selected strains although higher yielders are more susceptible to rust. Cross breeds give bolder seed, contain a higher percentage of oil and are almost immune to rust. Attempts are being made to combine the high yielding quality of selected strains and the high oil content of cross breeds. Experiments conducted regarding the effect of irrigation and the time of sowing prove that a higher seed yield is obtained if the crop gets 3 waterings and is sown in the third week of October.

Bihar and Orissa—The botanical section at Sabour is concentrating on the varieties of linseed grown in Bihar as well as the breeding of a type which will be resistant to wilt which is a very common disease of linseed. Promising results have been obtained but it is too early yet to introduce the new strains for general cultivation.

Bombay—In order to find a suitable variety for the Presidency, samples from 31 districts and 16 pure type selections were tried out. The results indicate that the local varieties are better yielders but the non-Presidency types may form suitable material for hybridization for the production of light coloured seeds.

Bengal—Five types of pure lines of linseed have been isolated from the Bengal crop. Four local varieties have been isolated whose

*The Inheritance of Characters in Indian Linseed by F. J. F. Shaw, A. R. Khan and M. Alam—Indian Journal of Agricultural Science—Vol. I—1931.

oil contents have been found to be as high as 42 per cent but they are not botanically pure

Statistical analysis of variance in yield isolation of pure line types from amongst the richest varieties and yield of the types richest in oil along with other points have been taken up by the Second Economic Botanist The University of Dacca is also conducting experiments under the supervision of the Department of Agriculture and analysing the oil content of the Bengal bred types but no results capable of practical application appear to have been obtained as yet

Punjab—The oilseeds Botanist at the Punjab Agricultural College Lyallpur has isolated 33 pure types from the mixtures grown in the province Some of the types gave a maximum yield of over 1800 lb per acre and possessed an oil content of over 48 per cent in the dry seed Bold seeded varieties of linseed are preferred owing to their higher oil content, but in most districts the small seeded varieties are better suited to local conditions owing to their characteristics of late flowering and late maturing and striking roots more readily In order to evolve a high yielding bold seeded strain possessing the growth habit and other desirable qualities of the small seeded variety the bold seeded and small seeded types have been intercrossed The work is at present in progress and bodes out promise of success

The seed of a white seeded hybrid has been obtained and its progeny has been intercrossed with some of the local bold seeded types which are brown in colour with a view to obtain an improved strain of lighter coloured seed with the desirable characteristics of the bold seeded variety

F—Further possibilities

Indian linseed ranks very high in quality among the produce of other countries of the world Second only to Baltic linseed it is superior to Argentine linseed Its inferiority to Baltic linseed is largely due to the presence of foreign matter and other oil seeds, such as mustard rape and owing to these crops being grown side by side with the linseed plant It has been proved that when the indigenous product is carefully separated from these foreign seeds the oil expressed from Indian linseed possesses as good drying properties as the best Russian oil *

The growing of clean seed and improved strains will further raise the economic value of Indian linseed and if by further research work more suitable varieties which are disease resisting high yielding and have a high oil content are evolved greater possibilities for Indian linseed in the world market may be visualised There are unfortunately no systematic records of the areas under improved seeds What is wanted at once is the creation of some form of organization for the distribution of suitable types of seed so that the cultivator may receive better value for his money and labour

*Chemical Technology of Oils Fats and Waxes Lewkowtsch Vol. II page 55 (1922 Edition)

INTER CHAPTER ELEVEN

In other countries there is generally a section of the trade which specialises in the production, multiplication and distribution of improved strains of seed to producers. In India this function is left to the Agricultural Departments. The amount of seed sown varies from 10 to over 20 lb per acre and the total requirements are in the neighbourhood of 26 000 tons for seeding approximately 4 million acres.

It is rather pathetic to learn that in the course of two years only 57 maunds of improved linseed were issued by the Agricultural Departments in Bengal and Bihar and that in other provinces and States the amount, if any, was not worth reporting.

In regard to wheat the position is much better. In view of the amount of experimental work which has been carried out, the stage has now been reached where definite efforts finally to test on a field scale and introduce into general cultivation in a systematic manner, superior strains of linseed are called for. Though agricultural departments, with limited resources, have done much in the way of seed distribution there are many crops on which little has been done. Moreover, there is need for the development of a new technique on broader lines for the systematic multiplication and distribution of agricultural seeds of all kinds. It may well be found desirable to allot these duties to a special staff of the Agricultural Department which should be charged with the duty of organising the production and distribution of improved seed, say by establishing and maintaining suitable forms of seed growers' associations for the purpose.

The seed used by the cultivator is generally retained by him. But often he feels compelled to sell all his crop in which case he borrows generally from the village

merchant on *sawar* or *deorhi* terms. In the former case he is bound to refund at harvest time, *i.e.*, after an interval of about six months, 25 per cent more than the quantity borrowed and in the latter case 50 per cent, which works out at a rate of interest equivalent to 50 and 100 per cent per annum respectively. In Bombay Presidency, however, at least one third of the growers obtain their seed on credit from the local *sahukars* in kind, who take repayment in kind equal to one and a half or double the quantity of seed originally lent, which is equivalent to about 200 per cent per annum. Apart from this where the seed advanced is reckoned in terms of cash, the village merchant generally calculates the rate at one seer per rupee less than the current market value when making the advance, and recovers from the debtor at the rate of one seer a rupee more than the current rate on liquidating the debt, so that the borrower loses both ways.

In the matter of research the possibilities of combining the production of linseed with that of fibre require further study even although it has already been the subject of numerous experiments in India. Some of the hybridising work indicates that it would be possible to secure a high yield of oil per unit per acre, *e.g.*, maximum yields of over 1,800 lb., per acre, with an oil content of over 48 per cent in the dry seed have been secured on Government farms, and it is desirable that some efforts should be made at an early date to see whether such results are capable of practical application on the cultivators' holdings.

CHAPTER XII—WEIGHTS AND MEASURES AND UNITS OF SALE

The chaotic state of weights and measures in the country undoubtedly hampers the development of organized trading. The unscrupulous also take full advantage of the diversity in the existing systems of weights and measures.

A—Weights and measures in current use

(1) WEIGHTS

There are so many types and kinds of weights in India that they differ not only from village to village but even within the village itself. The Railway or as it is sometimes called the Bengal maund (82 $\frac{2}{4}$ lb) with its sub multiples* is however the only recognized standard weight throughout the country being in general use at most of the larger trade centres.

The standard maund and its sub multiples are usually made of cast iron in the form of truncated cones or in rectangular shape. The denomination of each is embossed on the casting. On the other hand the weights used in the villages may be made of pieces of iron of all kinds of shapes and condition stones bricks or even bits of wood. The last Committee which reported as long ago as 1913 discussed the situation in the provinces in great detail. The conditions which then prevailed continue unchanged to the present day except that legislation for standardisation of weights and measures has been enacted in three provinces Bombay Central Provinces and Coorg.

The local weights known as *kachcha* weights are numerous and are used either exclusively or in conjunction with the standard weights. A few examples only of the enormous variations found in the *kachcha* seer may be quoted. In the Punjab the *kachcha* seer varies from 31 tolas in Hoshiarpur to 102 tolas in Dera Ghazi Khan. In the United Provinces the 92 tolas seer is in use in Hamirpur but the Ghazipur seer is of 112 tolas and in the neighbourhood of Gorakhpur (United Provinces) and the adjoining tracts of Bihar the local seer is based on the weight of a varying number of *Gandas* of 4 Gorakhpur pice the weight of a pice ranging from 120 to 200 grains. Again the seer is equivalent to 110 tolas in certain villages (Amkhera Chaki etc) of one *tehsil* in Jalaun 17 *Gohan* etc) of the same *tehsil*. The situation is still further aggravated when variations are found to exist in the same market for different commodities. For example at Cawnpore the maund for oilseeds is equivalent to 41 $\frac{1}{2}$ seers for groundnuts 50 seers for

*These are the tola, *chhatank* and seer as follows —

1 tola	= 41 $\frac{1}{4}$ oz (180 grains i.e. the weight of a rupee)
5 tolas	= 1 <i>chhatank</i>
16 <i>chhatank</i> s	= 1 seer (20 $\frac{3}{4}$ lb)
40 seers	= 1 maund (8 $\frac{1}{2}$ 2857 lb)

wheat and other cereals $41\frac{1}{4}$ seers and for tobacco and sugar $46\frac{1}{2}$ seers. So far as the linseed trade is concerned, standard weights are commonly used both in Bengal and in Assam. In Bombay stamped weights only are permitted under the Bombay Weights and Measures Act. In Kashmir, standard weights are used in the wholesale trade, but two local weights, namely, the *Pa* which varies from 20 to 32 seers, and the *Khruar* which is equivalent to 83 seers, are in vogue in the rural areas.

The same weights are used for the weighment of linseed oil and cake, but variations have also been found in the number of seers per maund for oil in different markets and for different oils in the same market.

(2) MEASURES

(a) *For Linseed*—Conditions regarding measures are even worse, if that is possible. This is so because measures are usually not based on any common factor, such as capacity to hold a definite weight of water, but are apparently made to hold a particular weight of the staple grain of the locality where they are in use. They are constructed by village artisans and are irregular in size while the practice of using them heaped further leads to malpractices. Measures are usually made of iron, brass, wood, closely bound bamboo strips, or earthenware.

The chief measure for grain and oilseeds in the Central Provinces is a *Paik*, the half being known as *Adholi*. There are other divisions which are by no means uniform. The *Paik* itself differs from 160 tolas in Amraoti to 40 tolas in Mandla. The integral multiple measure of the *Paik* is the *Kuro* or the *Katha*. The higher multiples are the *Mani*, the *Chowki*, the Maund and the *Khandy*.

In Central India and the Rajpntana States, similar measures are also in use, the chief being the *Paik* varying from 8 to 20 seers and the *Kurai* varying from 2 to 5 seers.

Weights are more generally used than measures in the United Provinces, except in some eastern districts where the *Sayee* or *Se* (equal to a local seer of rice) and the *Paik* or *Kurai* respectively are in vogue.

In Bihar and Orissa, on the other hand, measures are very extensively used. The *Paik* is a common unit, though others for example the *Kata* and *Gonta*, are also encountered in many places (though these differ both in name and capacity from place to place).

Hyderabad also uses the *Paik* which in that State is equivalent to 4 seers, the 2 seer unit being called *Adholi* or *Map* in different markets.

Basket measures are in vogue in Assam and may contain anything from 2 to 5 seers. The Madras measure holding 29 lb is in use in that Presidency, while Burma adopts a basket with a capacity of 9 gallons. Another form of measure used in the countryside in Burma, not necessarily for linseed, the trade in which is insignificant, is the common condensed milk tin.

The Bombay Weights and Measures Act has fixed the seer and its sub multiples and multiples as the measures of capacity, the 2 seers measures being called the *Adkoh*, and 4 seers the *Pyals*, 16 of which make up a maund. The *Map* consists of 2 maunds.

(b) *For oils*—The mills use the gallon measure, there being two types viz, the Imperial gallon and O M (old measure) gallon. The former holds about $9\frac{1}{4}$ lbs of linseed oil and the latter 8 lbs.

The O M gallon is more generally used in the retail trade for paints, varnishes and for the oil consumed in this trade. In Bombay the use of the O M gallon was originally prohibited under the Weights and Measures Act, but it was later modified to the extent that its use has been permitted provided the corresponding content in terms of the Imperial gallon is shown on the container.

(d) CHECKING OF WEIGHTS AND MEASURES

Except in the case of Bombay where the Act enjoins periodical checking there is no systematic verification of weights and measures. It is true that most of the local Governments have framed model bye laws and these have been adopted by the different local bodies but it appears that they have been more honoured in their breach than in their observance. The Punjab Municipal Act of 1911 provides for the checking of weights and measures by standard weights to be kept by the municipalities but during this survey it was discovered that the standard weights of the Delhi Municipality which is governed by the Act were not even traceable in its office.

B—Scales employed

The scales used in the linseed trade are of three types, namely, hand scales, beam scales and platform scales.

The typical hand scale has its pans made of leather, bamboo or iron and is used both in the retail trade as well as in the wholesale trade for weighing generally up to 5 seers. The pans of beam

scales are made of iron or wood and are suspended from the ends of the beam by chains or strong ropes. They are used for dealing with heavier quantities e.g. bags of seed or tins or drums of oil. Platform scales and weighing machines are used by railways, oil mills in one or two markets by a few merchants and in certain cases by exporters mainly for checking purposes. It has however been noticed that the weighing of linseed bags even when bought by shippers or crushers is preferably carried out on beam scales. In spite of the obvious convenience of platform scales in weighing heavy loads cultivators and merchants seem to have greater confidence in dead weight machines where the weights and the balancing of the scale can be seen. This factor besides the low initial cost of the beam scale and its freedom from mechanical complications accounts for the widely prevalent use of this type.

C.—Units of sale

With the great diversity existing in weights and measures the units of sale both for price quotations and transacting delivery necessarily vary in different provinces and markets.

(1) FOR PRICE QUOTATIONS

Of the two main linseed markets, Bombay and Calcutta, the quotations in the former are per hundredweight (112 lb) and in the latter per maund (82 2/7 lb). In the Central Provinces and Central India, prices are quoted per *Khandy* in some of the wholesale markets and per *Mani* in others. The *Khandy* may be anything from 5 to 25 railway maunds while the *Mani* varies from 4 to 20 railway maunds the latter being both a measure of weight as well as of capacity. In the village markets in these areas, however, prices are quoted per *Pauli* or other measures or per rupee in terms of measures. In the Rajputana States the quotations are either per maund or per *Mani*, varying in different States. Prices in the United Provinces are generally quoted per maund in most of the wholesale markets and also in terms of seers per rupee. In Bihar and Orissa, the quotations are per maund in wholesale markets and in terms of local weights in the villages. The *Palla* is the unit of transaction in Hyderabad.

Price quotations for oil may be based on the railway maund, local maund, tin gallon, 5 gallon drum or seers per rupee in the wholesale trade in different markets and per seer in terms of local as well as standard weights in the retail trade. Boiled oil is more commonly quoted on a gallon basis or per 5 gallon drum than by weight, and linseed oil imported from abroad is usually sold per 5 gallon drum.

(2) FOR TRANSACTING DELIVERY

The unit of delivery in wholesale markets is usually a bag of 54 maunds net. Where linseed is brought by carts to wholesale markets or to mills in bulk, the unit of delivery is a cart of about 16 maunds. Lots of 10 or 12 tons are common units of purchase by exporters and mills. As regards futures transactions these are in units of 25 and 10 tons in Bombay and Calcutta respectively but a certain amount of "futures trading" in 5 ton units takes place at Bombay under the auspices of a small association.

* * * * *

So far as weights are concerned it would seem desirable to standardise the Bengal (Railway) maund of 82 2/7 lb (=100 lb Troy) together with the other two weights in common use, the seer and the tola (the weight of a rupee) throughout the whole of India. These cardinal weights should stand in the relation

80 tolas	= 1 seer
40 seers	= 1 maund

The standardisation of liquid measures throughout India would seem to present no fundamental difficulty since a gallon of linseed oil occupies the same space as a gallon of any other liquid. As the ubiquitous kerosene oil tin which contains 4 Imperial gallons is India's "universal container", it seems probable that the Imperial gallon would be found the most generally acceptable standard of

liquid measure for the whole of the country. Further, it seems desirable that the containers used for oil should be clearly marked with their capacity.

Grain measures, however, present a problem of considerable difficulty. No measure will hold the same weight of different kinds of grain or of the same kind of grain grown in different parts of the country. The quantity contained in a measure differs accordingly as it is 'heaped' or 'struck', and depends also on whether it is shaken or not. Two people can seldom get exactly the same amount of grain into a measure. Their use, therefore, is an art which as often as not leads to artfulness. Standard grain measures could only be prescribed on a local basis after close study of local conditions and the measures in use. The question is well worth the serious attention of Provincial Governments within whose sphere such matters lie.

INTER-CHAPTER TWELVE

In the Bombay Presidency, the common railway maund of 82 $\frac{2}{7}$ lb, with sub multiples, has been standardised. One maund equals 40 seers and one seer equals 80 Tolas the Tola being of 180 grains—the weight of a rupee. Provision has also been made for testing and stamping of weights and for the inspection of the weights in actual use. This has been definitely to the benefit of the trade and the agriculturist and the scheme is rather more than self supporting. Elsewhere little has been done and it is unfortunate that on this vital matter there still remains a great deal of inertia to be overcome in some quarters.

In the linseed trade particularly, it is found that buyers in the villages customarily purchase on the basis of a heavy seer and sell on a lighter one. The seers vary enormously, e.g., in the Punjab the *kachcha* seer ranges from 31 tolas to 102 tolas and in the United Provinces from 40 to 112. In some of the eastern districts of United Provinces and the adjoining parts of Bihar, the local seer is based on the weight of a varying number of *gandas* of "Gorakhpur" pice, weighing from 125 to 250 grains. At Cawnpore, a maund of linseed equals 41½ seers, of groundnuts 50 seers and of sugar 18½ seers. At the two main linseed markets at Bombay and Calcutta the quotations are per cwt (112 lb), and per maund of 82 $\frac{2}{7}$ lb respectively. In the Central Provinces, quotations are on the basis of the *khandy* in some of the wholesale markets and per *man* in others, but the *khandy* may be anything from 5 to 25 railway maunds and the *man* from 4 to 20 railway maunds, the latter being a measure of capacity as well as weight.

There seems no necessity to multiply instances. The position is too absurd. As a first step towards the improvement of agricultural marketing and of business

in general, it is essential that standards of weights should be defined for the whole of India

The position so far as measures are concerned is equally ludicrous. Measures of capacity in grain present a problem of considerable difficulty since no two measures are alike and even the same measure will not hold the same weight of different kinds of grain or of the same grain grown in different parts of the country. The quantity also varies according as to whether the measure is "heaped" or "struck". Wherever possible, grain and seed measures should be replaced by standard weights but, where local custom is strong, provincial governments might with advantage establish standard measures.

A gallon of linseed oil O. M. (old measure) weighs about 8 lb, and the Imperial gallon about $9\frac{1}{4}$ lb. The standardisation of liquid measures throughout India should however present no fundamental difficulty since a gallon of linseed oil occupies the same space as a gallon of any other liquid. The common use of the kerosene oil tin throughout India seems to indicate that the Imperial gallon would be found the most generally acceptable standard of liquid measure for the whole of the country. Even in cases where local Governments feel compelled to introduce standard liquid measures, other than the Imperial gallon, it would be desirable that such measures should be capable of being easily convertible into terms of the Imperial gallon so that measures used in different provinces would be comparable.

As enquiries have shown that many of the scales in use are defective or inaccurate, the periodical testing of scales is as necessary as the inspection of weights. Beam scales are most useful and preferred to flat or spring weighing machines, as buyers and sellers in India have more faith in dead weight measures believing that they are less adaptable to malpractices.

In connection with any legislative provision for the standardisation of weights, it is essential that executive action should be taken to ensure that the scales used are correct. This is a matter for provincial governments. It may be added that the survey has shown that if the administrative responsibility for weights and measures is left to Municipalities and other local bodies, no real progress can be expected.

FINAL INTER-CHAPTER

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

As the object of this survey is to improve the returns to producers, the question arises therefore how this is to be done

We have seen in the course of the report that oil is the main product derived from linseed and that about half of the crop is retained in India and a similar quantity exported so that the exports and the internal market are of about equal importance. A substantial amount of linseed oil is used for human consumption, mainly in substitution for other edible oils or for purposes of adulteration. Linseed oil in turn can be replaced by other edible oils. In consequence the price which the consumer will pay for edible linseed oil is limited by the price of other vegetable oils and no incentive to a general rise in the price level can be expected from this source. In the export trade the selling price of Indian linseed is limited by world competition and particularly by the price of Argentine linseed even although the intrinsic quality of Indian linseed enables it to command a premium.

The main problem therefore is to secure for growers a larger share of the price which buyers are prepared to pay. At present he only gets about 10 annas in the rupee of the price paid by the exporters and the large millers at the ports and a little more than half the price paid by buyers in the United Kingdom. There appears therefore ample scope for reducing the price margin in favour of producers.

Reduction in Market Charges

This report shows how numerous these charges are and how heavily they bear on producers. One thing in

particular seems clear, namely, that the charges are relatively higher where the payments and deductions are made in kind instead of in cash. Such payments in kind have a tendency to grow. An *anji* (handful) for example instead of being 4 *chhatanks* becomes 24. Over a dozen different kinds of charges are frequently met with in the same market, and since most of the linseed passes through at least two markets the cumulative effect becomes considerable.

More systematic control of market charges is urgently called for by the establishment of regulated markets on the lines of those which already exist for cotton and some other commodities in the Central Provinces, Berar, Bombay, Hyderabad and Madras, and appropriate provincial legislation on these lines should present no difficulty. The essential features of such legislation would be—(a) defining of market areas, (b) the licensing of persons operating in the market or entitled to take fees or levy charges in the market, (c) registration of charges and fixation of the amount to be charged, (d) establishment of some system of control to ensure that the market regulations are observed.

It is unlikely that much progress will be made if the establishment and control of regulated markets is left entirely to Municipal authorities which are apt to be influenced by vested interests. Moreover they themselves are sometimes the worst offenders as heavy charges in the form of terminal taxes and octroi duties on agricultural produce marketed in the municipality often fall mainly on the producers and not on the urban consumers. Some regulation of octroi charges is indeed a matter for serious consideration.

Market News Service for producers

When market charges are registered they should be posted up conspicuously in the market. There should be an open declaration of prices whether or not the selling is done under the *purdah*. The daily prices should be posted up not only in respect of the market concerned, but also of the more distant key markets.

Although initial steps have been taken to broadcast linseed prices much more needs to be done to get the information regularly into the villages. It would serve no useful purpose, however, to broadcast the official prices recorded in provincial gazettes, as these are not representative. It should be one of the principal functions of provincial marketing staffs to collate reliable trade quotations, to organise the proper recording of prices in secondary markets and to provide summaries for broadcasting in terms intelligible to villagers.

It may be observed that the official estimates of yield per acre and of total production and even of the acreage seeded are far below the actual. Some improvement in this respect is urgently required.

Reduction in Harvest Time Depression of Prices

The seasonal depression in some parts is as much as 25 per cent and there seems therefore scope for controlled sales in these areas. The co-operative movement might be helpful in this direction but it has so far shown very little enterprise in the marketing of linseed. The seasonal movement in prices is less in those producing areas where village *ghanis* for crushing linseed are numerous, something should, therefore, be done to stop the present tendency for their numbers to decrease. This problem could best be solved by improving their efficiency and making mechanical improvements in their old-fashioned equipment. They could in this way be

put in a position to compete, particularly as *ghani* oil for edible purposes commands a premium of about Re 1 per maund over mill made oil. There are indications also that there is room for further development of large scale mill crushing of linseed say at Bombay, as this would prevent stocks at that market from having too depressing an effect on export prices.

"Futures" markets have a stabilising effect on the price of linseed up to September, but the subsequent price of the May "future" shows a bearish tendency, particularly at Calcutta. It would appear desirable that the September "futures" should be put back at least till October and that the May "futures" should not be opened as early as at present. In addition to the two "futures" markets which operate at present in Bombay and Calcutta, facilities might also be created at a limited number of points in the producing areas for the legitimate hedging of linseed stocks. The reform of the present system of "futures" markets however requires further examination in consultation with trade interests.

Economies in Distribution

Apart from the market charges already referred to the report shows that there is a considerable amount of waste incurred in carrying dirt and other impurities in the linseed long distances by rail and in having the linseed cleaned and recleaned at different stages when as a matter of fact the impurities could without extra cost, be largely eliminated before being loaded. To some extent the presence of these impurities is due to the practice of sowing mixed crops but this is a minor factor and the important point seems to be that the inclusion of a fixed non mutual 5 per cent deduction on account of refraction in the trade contracts at Calcutta practically compels sellers to adulterate the produce beyond that limit. This is an item that could easily be dealt with

by the standardisation of contract terms within the trade and the introduction of mutual instead of non-mutual terms

Railway freight is responsible for a large proportion of the distribution costs, but in this case the railway companies provide a large number of relatively cheap rates and there is, therefore, no inducement to carry linseed by road between points connected by rail. Considering that linseed is very sensitive to damage by water which in turn seriously affects the quality of the oil produced, there appears to be at some points need for better services to be provided by the railway companies in respect of better accommodation at loading stations, and some effort should also be made to eliminate what appears to be a one per cent loss in weight owing to the damage done to bags in the course of transit.

The bulking of linseed at upcountry markets would apparently lead to cheaper storage and to less damage being done to the product, but transport in bulk by rail does not yet seem feasible. Bulk transport by sea from Bombay to the United States of America apparently results in an economy of Rs 2 or Rs 3 per ton, and the question of taking then linseed in this form is a matter which should receive the consideration of the United Kingdom buyers.

Uniform Weights and Measures

Malpractices in regard to weights and scales are practically universal. In the case of linseed particularly, the general custom in the village is for the middleman to buy on a heavy seer and sell on a light one.

The first and most urgently required measure of reform is the standardisation of weights and measures

throughout India. The tola, seer and maund should be standardised in the relation 80 tolas equal one seer, and 40 seers equal one maund.

Measures for grain are a difficult proposition but for oil there seems no reason why so many different kinds of gallons should be in constant use and it would be highly desirable that all local Governments should make some attempt to adopt as a standard the imperial gallon

Elimination of Adulteration

Linseed oil is used extensively for the adulteration of other high priced edible oils. This imparts a certain amount of elasticity to the demand and keeps the price of linseed oil more or less in line with that of others but the practice is reprehensible. Linseed oil is in its turn subject to heavy adulteration by rosin and mineral oils, etc. While the case of edible oils could and should be dealt with by a stricter administration of the provincial food and drugs adulteration acts, there is much need for measures being taken to control the adulteration of non edible linseed oil used for industrial purposes. The oil industry itself could do a good deal to improve the position by adopting uniform standard quality specifications for different grades of linseed oil, both raw and boiled, by establishing recognised marks on containers and particularly by encouraging small containers which could remain sealed until they reach the final buyer.

Higher Prices for Higher Quality

It is clear that the large Bold type of linseed has a higher oil content than Small linseed and should command an adequate premium. It is essential however that the

trade should draw a clear distinction between the two types. Fortunately discussions between the Central Marketing Staff and seed trade organisations have resulted in an agreement for a standard all India contract for linseed, which not only clearly defines the different types but includes a scale of premia and discounts. The general adoption of this contract would be of mutual benefit to the trade and to producers and should do much to secure to the growers of good quality linseed, premiums for their produce more commensurate with its intrinsic value.

Distribution of Improved Seed

The production of high quality linseed is linked with the question of providing improved seed. The efforts of the Agricultural Departments in this direction are insignificant and a strong effort on entirely new lines, probably by the organisation of seed growers' associations is required to make improved seed in large quantities readily available to cultivators.

Research work on Government farms has resulted in the production of linseed having an oil content of 48 per cent as compared with a normal of 42 per cent, and giving a crop of 1 800 lb per acre, as against an average standard yield of somewhere about 400 lb. It remains to be seen however whether and how far those results could be reproduced on cultivators' holdings.

Expansion of the Market

There has been some reduction in the export market for Indian linseed in Continental countries. This reduction has been the natural result of general trade restrictions imposed by those countries. It is however a question as to how far those markets could be regained. At present the United Kingdom provides by far the most

important outlet for Indian linseed and this has increased considerably since the introduction of the Ottawa Agreement in 1932-33

It would appear that the Agreement has been mutually beneficial in that India has secured a more stable and larger share of the United Kingdom market whilst buyers in England have not had to pay, on the average, any more for their linseed as compared with the ex duty price for the Argentine linseed before the introduction of the tariff preference

The expansion of the internal demand for linseed depends entirely on the development of the local crushing industry which has made enormous strides during the last 25 years. Appreciable quantities of linseed oil are still imported even though the standard of quality of Indian oils is now as high, and indeed in some cases higher than that of imported products. The latter are still however in favour by many buyers including small retailers, on account of the fact that they are sold in branded sealed containers and are of dependable uniform quality. This lesson therefore should not be lost on our own manufacturers who should take similar steps to make their product equally commendable to users. If this were done thoroughly there seems no reason why as well as extending the market for Indian linseed oil in India, a good export trade might not be developed, especially in those countries bordering on the Indian and Pacific Oceans which are conveniently situated for being supplied direct from India. It is difficult to see, however, how this is to be achieved unless the industrial interests are prepared to unite together in a common cause. A strong representative all India association of manufacturers should be capable of ensuring a higher reputation not only for oil but also for linseed cake exported from India, and could do something to counter

act the adverse effects on the export trade in cake, caused by the operation of somewhat onerous restrictions and what seems to be a too strict interpretation of the contract terms relating to the presence of castor seed husk

It is to be hoped, however, that in the near future with the development of the dairying and animal husbandry industry in this country, it may be possible to absorb a greater quantity of linseed cake at reasonable prices. This will be for the benefit of agriculture as a whole and particularly advantageous for mills located in villages of the producing areas

APPENDICES.

APPENDIX I

World acreage, production and exports of Linseed

Countries	Area (Thousand acres)				Production (Thous and tons)				Exports (Thousand tons)			
	Average 1909 13	Average 1931 35	1936 *	1937 *	Average 1909 13	Average 1931 35	1936 *	1937 *	Average 1909 13	Average 1931 35	1936	1937
India	3,818	3,708	3,892	4,921	497	474	478	475	368	188	309	271
Argentina	3,708	6,174	6,533	7,923†	778	1,775	1,850	1,560	677	1,667	1,454	1,773
U S A	2,498	1,770	1,180	924	489	251	148	174	2			
Canada	1,035	377	468	241	302	44	45	18	183	10	5	(b)
Other countries	1,521	1,245	1,799	1,805	231	240	391	273	276	20	38	124
U S S R †	3,200	6,706	5,798	5,855	479	750	(a)	(a)	134			
World Total (excluding U S S R)	12,660	13,274	11,872	13,514	2,297	2,784	2,912	2,509	1,806	1,885	1,806	2,168

Source.—International Review of Agriculture, Rome. The Indian figures of acreage and production, excepting for the prewar average, represent the revised figures discussed in the text.

* The years indicated are those of harvest. In Argentina the crop is harvested from November to January next year.

† Area sown.

‡ Total area for flax and linseed.

(a) Not available.

(b) 300 Tons.

APPENDIX II *Area under Linseed in the main producing areas in India* (Thousand acres)

	1925 26	1926 27	1927 28	1928 29	1929 30	1930 31	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37.
BRITISH INDIA—												
Bengal	134	130	118	132	114	116	126	125	124	126	98	131
Bihar (and Orissa)	687	614	601	668	654	654	662	641	631	589	549*	559*
Bombay	121	106	102	119	131	137	137	125	124	127	113	101
Central Provinces and Berar	1,148	1,001	917	939	774	739	937	1,008	933	997	1,131	1,131
Punjab	20	26	35	28	28	28	32	28	32	26	28	31
United Provinces	331	503	423	210	229	310	321	228	213	240	195	298
(a)	762	608	630	550	502	644	589	624	503	622	650	600
Total British India	3,202	2,974	2,826	2,927	2,412	2,628	2,804	2,779	2,650	2,737	2,764	2,851
INDIAN STATES—												
Bhopal (Central India)*	0	10	7	0		8	10	44	37	47	47	45
Bombay States	102	80	100	97	81	38	94	103	128	128	130	130
Central Provinces States	178	220	318	269	242	231	306	293	367	399	416	468
Hyderabad	105	38	60	110	57	82	95	93	73	92	94	94
Kotah (Rajputana)												
Total Indian States	394	357	485	482	390	381	505	520	611	673	693	743
GRAND TOTAL	3,596	3,331	3,311	3,109	2,802	3,009	3,309	3,299	3,261	3,410	3,457	3,594 (b)
REVISED GRAND TOTAL†	4,211	3,820	3,924	3,654	3,610	3,506	3,824	3,711	3,650	3,843	3,892	4,021

Source—Estimates of Area and Yield of Principal Crops in India.

* Bihar—540 and 550 Orissa—9 in each year

† The Revision of acreage has been discussed fully in the text

(a) Represents the 'mixed' crop, i.e., seed sown in the same field with other crops

(b) Revised figure 3,677

V B—According to the 1937 Forecast, acreage under linseed in 1937 38 is estimated as follows—Bengal 137, Bihar 587, Orissa 8 Bombay 107 Central Provinces and Berar 1 243 Punjab 30 United Provinces 948 Bhopal 63, Bombay States 6 Central Provinces States 130, Hyderabad 471, and Kotah (Rajputana) 107 Total 3,839 (thousand acres)

APPENDIX III

Area under Linseed in certain provinces and States in India

(Not included in crop forecasts)

(Thousand acres)

	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937*
BRITISH INDIA												
Assam	12	12	11	11	12	12	2	3	4	0	4	6
Madras	12	7	4	5	4	6	6	2	3	7	2	2
Burma N W F P, and Ajmer Merwara						1	1	1	1	2		1
Total British India	24	19	15	16	16	16	9	6	8	15	6	9
INDIAN STATES—												
Central India States—												
Indore	43	41	45	42	23	31	46	43	33	40	38	36
Others	0	12	14	16	10	14	16	15	10	19	10	16

Gwahar	106	62	77	98	49	74	89	86	69	80	85	80
<i>Rayputana States—</i>												
Dund ..	25	12	25	25	25	26	19	22	18	19	11	21
Tenk .	13	11	15	19	10	16	18	11	10	12	14	13
Others	5	3	3	4	3	5	5	3	3	4	4	4
Punjab States	4	12	2	2	5	1	1	2	2	1	2	2
United Provinces States	4	5	3	3	4	5	5	5	5	6	5	5
Kashmir	37	33	26	18	25	30	37	27	21	24	30	28
Other Indian States	2	3	3	3	1	3	1		1		..	2
Total Indian States	248	194	213	230	156	205	237	214	178	205	118	207
GRAND TOTAL	272	213	229	245	172	221	246	220	186	220	224	216

Source --Agricultural Statistics of India

* 1935-36 and 1936-37 figures from the returns received from the Director General of Commercial Intelligence

APPENDIX IV

Yield per acre of Jowar in the main producing areas in India

(In lbs per acre)

	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37
INDIAN INDIA--												
Bengal	301	329	247	322	373	367	356	448	434	480	366	427
Bihar (and Orissa)	376	341	313	308	366	322	311	339	327	348	310*	310*
Bombay	185	169	264	282	222	229	229	251	235	212	238	177
Central Provinces and Berar	140	168	176	130	193	197	208	184	192	198	188	168
Punjab	232	172	192	240	240	160	210	240	210	258	198	180
United Provinces	347	382	201	309	459	362	389	380	322	361	300	369
Average British India.	262	289	274	269	329	297	299	297	277	296	270	278

INDIAN STATES—										
Bhopal (Central India)									238	249
Bombay States	249	224	320	373	172	280	224	373	238	249
Central Provinces States	198	151	179	92	184	177	191	187	175	175
Hyderabad	201	132	77	92	148	142	168	150	191	211
Kotah (Rajputana)	43	118	251	41	118	246	236	217	195	238
Average Indian States	159	138	125	84	149	170	186	174	176	193
Average India	250	273	236	232	304	281	282	279	258	251 (a)
Revised All India Average	248	277	247	240	282	281	279	304	287	286

Source—Estimates of Area and Yield of Principal Crops in India

* Orissa 249 lb

† The revised yield per acre has been discussed in the text

(a) Revised figure 256

APPENDIX V

Production of Linseed in the main producing areas

(Thousand tons)

	1925 26	1926 27	1927 28	1928 29	1929 30	1930 31	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37
BRITISH INDIA—												
Bengal	18	20	13	15	19	19	20	25	24	27	16	25
Bihar (and Orissa)	103	98	84	108	107	94	92	97	92	93	70*	85*
Bombay	19	8	12	15	13	14	14	14	13	12	12	8
Central Provinces and Berar	72	75	72	54	65	60	87	83	80	88	80	85
Punjab	3	2	3	3	3	2	3	3	3	3	2	3
United Provinces	59	67	55	29	46	50	56	39	31	39	34	48
(a)	109	114	82	76	101	104	102	108	85	100	113	100
Total British India	374	384	321	304	354	348	374	369	328	362	333	354

APPENDIX VI

*Production of Linseed in certain provinces and States of India**(Not included in the crop forecasts)*

	Average area for 10 years (thousand acres)	Approximate yield per acre (lb)	Approximate production (tons).
BRITISH INDIA—			
Assam	8	492	1,760
Madras	6	300	670
Ajmer Merwara, Burma and North West Frontier Provinces	1	267*	120
INDIAN STATES—			
<i>Central India States—</i>			
Barwani, Indore, Nagod, Narsingarh, Orcha, Rajgarh, Dhar, Datia, Bijawar, Ajajgarh, Chattarpur, Rewah, Charkhari, Dewas Junior, Dewas Senior, Jaora, Saulana	245	270	29,530
Gwahar	70	370	13,050
<i>Rajputana States—</i>			
Bundi, Jaipur, Jhalawar, Tonk, Marwar, Patgarh and Udaipur	57	220	5,600
<i>Punjab States—</i>			
Kapurthala, Patiala, Kalra, Bahawalpur	3	287	389
<i>United Provinces States—</i>			
Benares, Rampur	5	360	800
Kashmir	28	410	5,130
Mysore and Baroda	1	267*	120
Total	432	..	67,160

* All India Average.

Source — Agricultural Statistics of India and data collected during the Survey.

APPENDIX VII.

*Number of grains per gramme and oil content in commercial samples of
Linseed collected from different parts of India*

	Number of grains per gramme			Oil in cleaned seed		
	Maxi- mum	Mini- mum	Average	Maxi- mum%	Mini- mum%	Average %
Assam	208	177	190			39.21
Bengal	229	177	201	41.22	38.09	39.45
Bihar (North)	273	131	190	43.91	38.19	40.57
Bihar (South) and Orissa	231	114	155	43.47	38.84	41.56
Bombay Presidency	159	119	134	44.63	40.66	42.87
Central India States	161	96	116	47.43	41.34	44.62
Central Provinces (East)	177	108	164	48.43	39.80	42.76
Central Provinces (Central)	169	106	130	45.92	40.09	43.13
Central Provinces (West) and Berar	215	114	122	44.96	39.81	43.16
Hyderabad	144	120	129	44.71	41.02	42.93
Kashmir	241	203	223	42.76	39.33	40.90
Madras	171	132	154			40.78
Mysore	193	155	170			
Punjab	330	156	237	41.71	39.90	40.95
Rajputana	131	97	110	44.44	42.69	43.54
United Provinces (North-east)	203	103	163	43.42	40.98	41.84
United Provinces (Central)	273	108	154	43.23	41.44	42.48
United Provinces (South-west)	119	101	110	44.57	41.98	43.46
At Bombay Port	171	107	135	45.78	42.47	43.56
At Calcutta Port	206	135	174	47.64	40.31	41.37
From Shipments for export from Bombay	162	124	136	43.48	40.60	43.04

NOTE—1 tola = 11.66 grammes

APPENDIX VIII

Approximate production of different qualities of Linseed in India classified according to the present commercial standards

	Approximate total production (Average 1933-34 to 1935-36 crops)	White and yellow Linseed				Brown Linseed			
		Quantity		Proportion		Quantity		Proportion	
		Thousand tons	Percentage	Thousand tons	Percentage	Thousand tons	Percentage	Thousand tons	Percentage
United Provinces with States	135								
Bihar (and Orissa)	87								
Central Provinces with States	91	2.7	3	50.4	62	21.7	25	65.3	75
Central India and Gwalior States	47	0.9	2	25.9	75	1.4	3	31.0	35
Bengal	22								
Hyderabad	55								
Bombay with States	14			52.2	95	2.8	5	22	100
Rajputana States	14			11.2	80	1.4	10		
Kashmir	5	0.3	2	13.7	98			1.4	10
Punjab	3								
Assam, Madras and Others	3							5	100
								3	100
TOTAL	470	3.9	0.8	186.4	70.1	40.8	8.0	244.0	51.5

APPENDIX IX

Average monthly despatches and arrivals of Lmsed at certain important centres of production and consumption

Month	Despatches						Arrivals							
	United Provinces— (10 stations— Average of 2 years)		Bihar and Orissa— (10 stations— Average of 2 years)		Bengal— (2 stations— Average of 2 years)		Bombay Pres- idency (7 sta- tions—Average of 2 years)		Central Provi- nces—(3 markets— Average of 5 years)		Calcutta (Kanta- pukur sheds— Average of 5 years)		Bombay Port (Average of 5 years)	
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%
January	122	2.8	1 063	0.1	7	0.7	216	4.1	301	2.9	0 102	4.5	3 308	3.2
February	175	4.0	807	4.6	25	2.4	498	9.4	1 231	9.8	3 129	3.8	4 661	4.5
March	180	3.4	1 168	6.7	341	32.9	1 014	19.8	5 466	43.5	7 192	5.4	14 040	13.4
April	474	10.8	2 033	11.6	312	30.1	1 021	19.4	2 796	22.3	14 815	11.0	15 012	14.3
May	977	22.3	3 504	20.0	1 100	18.3	816	15.5	1 373	10.6	22 385	10.7	20 730	19.8
June	367	8.4	2 167	12.4	59	5.7	300	5.7	413	3.3	15 488	11.5	8 405	8.0
July	471	10.8	1 520	8.7	43	4.2	73	1.4	62	0.5	12 241	9.2	0 023	8.6
August	418	9.6	988	5.7	18	1.7	167	3.0	40	0.3	9 720	7.3	6 231	5.9
September	607	13.9	1 409	8.1	5	0.8	303	5.8	31	0.2	12 807	9.5	11 150	10.6
October	347	7.9	676	3.9	26	2.5	376	7.0	135	1.1	10 806	8.1	5 048	4.8
November	121	2.8	1 083	6.2	7	0.7	194	3.7	275	2.2	11	5.5	3 072	2.9
December	144	3.3	946	5.4	7	0.7	273	5.2	418	3.3	10 060	7.5	4 231	4.0
Total	4 373	100	17 460	100	1 020	100	5 267	100	12 567	100	134 264	100	104 927	100

*Rasht Chugan Ori

†Buxar, Kaghunathpur,

‡Chandigarh, Beldanga

§Jeur, Sholapur, Akalkot Road

¶Raipur, Rajnandgaon, Khangaon

*Rasht Chugan Ori
†Buxar, Kaghunathpur, Arrah
‡Chandigarh, Beldanga
§Jeur, Sholapur, Akalkot Road
¶Raipur, Rajnandgaon, Khangaon

APPENDIX X

Exports of Linseed from India (British Indian Possessions)

(Thousand tons)

	1925 26	1926 27	1927 28	1928 29	1929 30	1930 31	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37
United Kingdom	111	49	57	18	79	53	14	14	176	104	90	218
Australia	20	16	20	22	23	11	10	10	12	21	10	18
Others	1	1		1					7			7
Total British Empire	132	66	77	41	102	69	24	24	188	132	100	243
Germany	10	13	18	6	10	10	10	9	10	5	8	14
Netherlands	17	5	5		7	23			4	1		6
Belgium	32	17	6	2	13	13	1		10	1	4	..
France	62	51	61	47	51	25	44	22	43	14	8	7
Spain	1	6	4	7	7	9	4	2	9	4	2	1

APPENDIX XI

Acreage, production, exports and quantities of Linseed retained in India

Year	Acreage	Production	Imports	Total supplies	Export	Quantity retained in India	Percentage of quantity retained to production
	Thousand acres	Thousand tons	Thousand tons		Thousand tons	Thousand tons	
1	2	3	4	5	6	7	8
1901 02	2 884	326	2	328	366	—38	+
1902 03	3 045	352	2	354	316	38	10 8
1903 04	3 213	482	4	486	431	55	11 4
1904 05	4 201	572	3	575	559	16	2 8
1905 06	4 394	347	1	348	289	59	17 0
1906 07	3 279	353	1	354	219	135	38 2
1907 08	3 743	425	1	426	310	116	27 3
1908 09	2 099	164	1	165	160	5	8 0
1909 10	2 997	298	2	300	234	66	22 1
1910 11	3 188	428	9	437	371	66	15 4
1911 12	3 742	571	11	582	522	60	10 5
1912 13	5 038	645	8	653	354	299	46 4
1913 14	4 125	542	7	549	414	135	24 9
1914 15	3 031	386	8	394	322	72	18 7
1915 16	3 320	397	4	401	193	208	62 4
1916 17	3 333	476	8	484	394	90	18 9
1917 18	3 564	526	8	534	146	388	73 7
1918 19	3 797	515	9	524	291	233	45 2
1919 20	1 989	235	6	241	202	—11	+
1920 21	3 103	419	7	426	188	238	56 8
1921 22	2 269	270	6	276	174	102	37 7
1922 23	3 011	436	6	442	274	168	38 5
1923 24	3 382	533	5	538	369	169	31 7

APPENDIX XI—contd

Year	Acreage	Production	Imports	Total supplies	Export	Quantity retained in India	Percentage of quantity retained to production
	Thousand acres	Thousand tons	Thousand tons		Thousand tons	Thousand tons	
1	2	3	4	5	6	7	8
1924-25	3,724	463	5	468	371	97	21.0
1925-26	3,695	501	14	515	308	207	41.3
1926-27	4,211	466	21	487	192	295	63.3
1927-28	3,820	473	25	498	223	275	58.1
1928-29	3,824	422	15	437	157	280	66.4
1929-30	3,654	401	21	422	248	174	43.4
1930-31	3,510	442	18	460	257	203	45.9
1931-32	3,506	440	15	455	120†	335	76.1
1932-33	3,824	476	16	492	72†	420	88.2
1933-34	8,711	504	16	520	383†	137	27.2
1934-35	3,656	458	10	468	240†	228	49.8
1935-36	3,843	492	14	506	165†	341	69.3
1936-37	3,892	478	13	491	296†	195	40.8
1937-38	4,021	475	11	486	226	260	54.7

Notes—(a) As the production from the crop of a particular year is exported in the following year, the statistics of area and production mentioned against each year are those of the preceding year's crop in order to correlate them with export figures.

(b) The data regarding area and production upto 1925-26 have been abstracted from Estimates of Area and Yield of Principal Crops and refer only to areas for which forecasts are prepared and not to the total husked crop. The data from 1926-27 represents revised acreage and production of the total Indian Crop. The figures for different years are not strictly comparable owing to addition to reporting areas from time to time.

(c) Export figures are taken from "Seaborne Trade of British India". The quantities retained include seed.

+ Exports exceeded the previous year's production and include quantities exported from carry overs.

† Including exports from Mormugao (Portuguese India).

‡ Figures from 1900-01 to 1909-10 represent imports from Land Frontiers into U P only and from 1921-22 to 1924-25 into Bihar only. For other years the figures are totals of imports into U P and Bihar.

APPENDIX XII

*Imports and exports of Linseed (by rail and river) into and from different provinces and States of India during 1919-20 and 1934-35 to 1936-37 **

(Thousand tons)

Province and State	Imports into		Exports from	
	1919-20	Average 1934-35 to 1936-37	1919-20	Average 1934-35 to 1936-37
Assam	(a)	(a)	2.4	1.6
Bengal	132.8	121.9	0.1	0.1
Bihar (and Orissa)	0.3	2.9	91.3	75.2
Bomb	61.9	112.6	2.2	(a)
Central India	(a)	0.1	18.8	24.0
Central Provinces and Berar	0.6	1.1	13.2	22.3
Hyderabad	(a)	(a)	17.9	41.9
Kashmir				
Madras	(a)	7.6	0.8	0.1
Mysore	(a)	(a)	(a)	(a)
Punjab	0.4	0.2	0.4	(a)
Rajputana	(a)	(a)	6.4	13.3
Sind and British Baluchistan	7.6	(a)	(a)	(a)
United Provinces	0.9	1.0	55.8	63.9

* Adapted from Accounts relating to the Inland (Rail and River borne) Trade of India

(a) Less than 100 tons

APPENDIX XIV.

Average monthly wholesale prices per maund of Bold and Small Mustard at Bombay*
(Basis 4 % reduction monthly.)

Month	1932-33		1933-34		1934-35		1935-36		1936-37		1937-38	
	Bold	Small	Bold	Small	Bold	Small	Bold	Small	Bold	Small	Bold	Small
April	Rs 4 5 0	Rs 3 15 10	Rs 4 5 0	Rs 3 10 11	Rs 4 10 0	Rs 4 7 11	Rs 4 13 5	Rs 4 11 5	Rs 4 10	Rs 4 3 8	Rs 4 14 7	Rs 4 8 12 4
May	Rs 4 4 3	Rs 3 16 5	Rs 4 5 0	Rs 4 0 11	Rs 5 2 10	Rs 4 15 5	Rs 4 15 0	Rs 4 17 0	Rs 5 3 9	Rs 5 2 7	Rs 5 0 8	Rs 5 11 2
June	Rs 3 15 0	Rs 3 10 11	Rs 4 8 11	Rs 4 8 4	Rs 5 3 0	Rs 5 1 1	Rs 4 11 11	Rs 4 10 4	Rs 5 5 0	Rs 5 3 10	Rs 5 12 10	Rs 5 9 11
July	Rs 4 4 1	Rs 3 15 5	Rs 5 0 7	Rs 4 14 8	Rs 4 15 7	Rs 4 14 7	Rs 4 12 0	Rs 4 10 11	Rs 5 12 11	Rs 5 0 1	Rs 5 0 2	Rs 5 13 2
August	Rs 4 0 3	Rs 4 2 5	Rs 5 13 5	Rs 4 12 8	Rs 5 2 8	Rs 5 1 11	Rs 4 12 5	Rs 4 11 0	Rs 5 3 5	Rs 5 11 0	Rs 5 15 3	Rs 5 13 10
September	Rs 4 12 5	Rs 4 5 0	Rs 4 11 5	Rs 4 10 7	Rs 4 12 2	Rs 4 11 5	Rs 4 14 0	Rs 4 13 1	Rs 5 5 7	Rs 5 3 8	Rs 5 0 7	Rs 5 14 0
October	Rs 4 8 10	Rs 4 3 0	Rs 4 4 1	Rs 4 3 0	Rs 4 0 4	Rs 4 8 1	Rs 5 1 4	Rs 4 15 5	Rs 5 2 11	Rs 5 1 3	Rs 5 16 0	Rs 5 13 2
November	Rs 4 8 0	Rs 4 2 0	Rs 4 7 4	Rs 4 8 11	Rs 4 7 8	Rs 4 8 8	Rs 4 15 8	Rs 4 14 2	Rs 5 3 11	Rs 5 2 4	Rs 5 10 11	Rs 5 9 7
December	Rs 4 7 5	Rs 4 2 8	Rs 4 5 0	Rs 4 4 7	Rs 4 11 11	Rs 4 10 8	Rs 5 1 5	Rs 4 15 4	Rs 5 8 5	Rs 5 0 11	Rs 5 12 1	Rs 5 10 8
January	Rs 4 0 4	Rs 4 4 2	Rs 4 5 8	Rs 4 4 5	Rs 5 2 3	Rs 5 0 0	Rs 5 5 10	Rs 5 3 1	Rs 5 7 8	Rs 5 5 3	Rs 5 14 8	Rs 5 11 7
February	Rs 4 4 0	Rs 4 0 11	Rs 4 8 1	Rs 4 3 5	Rs 4 14 0	Rs 4 12 8	Rs 5 3 2	Rs 5 1 4	Rs 5 0 1	Rs 4 8	Rs 5 11 2	Rs 5 10 3
March	Rs 3 15 5	Rs 3 12 7	Rs 4 7 4	Rs 4 4 7	Rs 4 9 0	Rs 4 7 11	Rs 5 3 8	Rs 5 2 5	Rs 5 13 2	Rs 5 10 10	Rs 5 8 10	Rs 5 7 10
Annual Average	Rs 4 5 10	Rs 4 0 10	Rs 4 7 7	Rs 4 5 7	Rs 4 13 10	Rs 4 12 3	Rs 4 15 11	Rs 4 14 2	Rs 5 7 10	Rs 5 5 7	Rs 5 13 0	Rs 5 11 8

* Adapted from Bombay Chamber of Commerce quotations.

APPENDIX XV

*Average monthly wholesale prices per maund of Bold and Small Linseed at Calcutta **
(Base a 5% discount on non-matral)

Month	1932-33		1933-34		1934-35		1935-36		1936-37		1937-38	
	Bold	Small	Bold	Small	Bold	Small	Bold	Small	Bold	Small	Bold	Small
Apr 1	Rs. A P 3 15 4	Rs. A P 3 12 10	Rs. A P 3 11 2	Rs. A P 3 10 3	Rs. A P 4 7 8	Rs. A P 4 7 2	Rs. A P 4 10 6	Rs. A P 4 9 6	Rs. A P 5 2 11	Rs. A P 5 2 7	Rs. A P 5 1 10	Rs. A P 5 1 8
May	3 10 4	3 9 3	4 2 0	4 1 5	5 0 6	4 16 11	4 13 0	4 12 0	5 3 0	5 2 2	6 1 1	6 0 7
June	3 10 0	3 8 5	4 8 2	4 7 6	5 2 7	5 2 1	4 11 3	4 10 3	5 2 3	5 1 3	6 13 8	6 12 12
July	3 13 4	3 11 4	4 14 4	4 13 10	4 13 3	4 12 9	4 11 3	4 10 3	5 8 7	5 7 8	6 1 0	6 0 6
August	4 3 10	4 1 0	4 9 6	4 9 0	6 1 7	6 1 1	4 12 11	4 10 11	5 13 10	5 13 4	6 2 6	6 1 11
September	4 7 4	4 6 6	4 9 4	4 8 10	4 12 5	4 11 11	4 13 8	4 11 11	5 10 5	5 9 10	6 2 2	6 1 8
October	4 5 2	4 3 6	4 1 11	4 1 5	4 9 2	4 8 6	5 2 0	5 1 0	5 9 4	5 7 4	6 2 2	6 1 3
November	4 3 0	4 3 5	4 7 0	4 6 6	4 5 1	4 3 11	6 0 2	4 15 0	5 8 3	5 7 3	5 13 9	5 12 11
December	4 6 10	4 4 6	4 6 11	4 6 5	4 11 8	4 10 6	4 15 6	4 14 6	5 10 4	5 9 0	5 12 2	5 11
January	4 6 6	4 5 0	4 6 11	4 5 6	5 0 0	4 14 3	5 5 6	5 4 6	5 13 6	5 12 11	5 14 10	5 13 6
February	4 1 9	4 0 3	4 5 2	4 7 8	4 13 11	4 12 2	5 3 5	5 2 5	5 10 8	5 10 2	5 12 1	5 11 7
March	3 12 8	3 11 3	4 6 6	4 5 11	4 8 2	4 7 5	5 3 3	5 2 5	5 13 11	5 13 5	5 8 10	5 8 4
Annual Average	4 1 2	3 15 5	4 6 3	4 5 8	4 12 6	4 11 8	4 15 3	4 14 1	5 8 10	5 8 1	5 16 2	5 14 6

* Adapted from Bengal Chamber of Commerce quotations

APPENDIX XVI

Average monthly c & f prices of Calcutta Linseed in London

(Shipment during the current or following month)
(Per ton.)

Month	1926 27	1927 28	1928 29	1929 30	1931	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37	1937 38
	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
April	16 17 0	17 10 0	18 2 6	18 0 0	10 5 0	10 12 0	9 13 0	0 12 6	11 6 3	11 10 0	12 12 0	14 18 3
May	16 15 0	18 10 0	18 2 8	17 12 6	18 12 6	10 3 0	9 5 0	10 18 9	12 10 0	11 13 9	12 7 0	14 16 0
June	17 18 9	18 10 0	18 16 0	17 6 0	18 2 6	10 2 6	9 6 3	11 10 0	12 10 0	11 11 3	12 12 0	14 7 0
July	19 12 6	17 16 3	17 16 3	19 12 6	16 12 6	10 15 0	10 12 6	12 3 0	11 18 9	11 12 6	13 10 0	13 1 0
August	18 12 0	17 12 0	17 13 0	20 12 6	17 13 9	10 3 0	10 13 9	11 10 0	12 11 3	11 13 9	14 2 6	15 4 0
September	17 2 0	17 7 0	17 15 0	23 12 6	18 8 0	11 0 0	11 6 3	11 7 6	11 13 9	12 1 3	13 12 6	15 4 0
October	17 2 0	17 5 0	19 13 0	23 15 0	14 5 0	11 0 0	10 17 6	10 16 0	11 8 9	12 12 0	13 5 0	15 3 3
November	17 7 6	17 2 6	19 5 0	22 17 6	19 15 3	11 5 0	10 12 6	11 3 9	10 17 0	12 0 3	13 10 0	14 15 3
December	17 5 0	17 2 6	19 15 0	22 16 0	13 13 9	11 0 0	11 1 3	11 0 0	11 12 6	12 12 6	14 5 0	15 1 3
January	17 7 6	17 10 0	19 0 0	20 18 0	11 15 0	11 3 0	11 0 0	11 1 3	12 1 3	13 1 3	14 7 0	15 0 0
February	18 2 6	17 10 0	19 6 3	19 2 6	11 10 0	11 11 3	10 5 0	11 2 6	11 15 0	12 15 0	13 19 0	14 10 3
March	17 12 6	17 15 0	18 12 0	18 5 3	11 3 6	10 17 6	9 16 0	10 18 9	11 2 6	12 16 3	14 7 6	13 15 3
Average	17 11 4	17 13 0	18 9 10	20 7 6	16 0 3	10 16 6	10 5 8	11 2 0	11 15 8	12 3 10	13 10 9	14 16 10

Source.—Annual Reviews of the Oilseed Oil and Cake Markets published by Frank Fyfe & Co., London.
Prices for 1937 38 are based on weekly cash received from the High Commission for India, London.

APPENDIX XVII

Average monthly *c & f* prices of Plate Linseed in London

(Shipment during the current or following month)

(Per ton,

Month.	1924-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
April	14 12 6	15 3 0	15 17 6	16 17 6	18 1 3	8 17 6	7 17 6	8 6 9	9 15 0	9 10 0	10 18 9	13 2 9
May	14 13 9	15 8 9	16 4 3	16 16 3	17 10 0	8 6 9	7 13 9	0 10 0	10 17 6	9 8 9	10 15 0	13 4 6
June	15 12 6	16 8 9	16 15 0	15 15 0	16 16 9	8 10 0	7 12 6	10 10 0	11 0 0	9 6 3	11 0 0	12 19 9
July	15 15 0	16 0 0	15 15 0	15 10 0	15 0 0	8 8 9	8 0 0	11 7 6	10 16 3	9 7 6	11 15 0	13 3 0
August	15 10 0	16 0 0	15 6 3	15 11 3	15 12 6	6 6 0	6 10 0	11 0 0	11 10 0	9 8 9	12 6 0	13 4 0
September	15 10 0	16 0 0	15 7 6	23 8 9	13 6 9	7 17 6	9 5 0	10 17 6	10 12 6	10 1 3	11 15 0	13 5 9
October	15 12 6	16 13 6	16 0 0	23 0 0	11 17 6	8 13 9	8 16 3	0 17 6	10 6 3	10 11 3	11 0 3	13 12 8
November	16 0 0	15 7 5	15 16 3	20 18 9	10 10 0	9 3 9	8 16 3	9 13 0	9 2 6	9 12 9	11 5 0	12 13 6
December	15 10 0	15 8 9	15 10 0	19 1 3	9 0 0	9 0 6	8 17 6	9 5 0	9 8 9	10 13 9	11 16 3	12 10 3
January	16 3 9	15 5 0	15 11 3	17 17 6	8 7 6	8 16 0	6 16 0	0 6 3	9 11 3	11 2 6	11 19 6	12 16 0
February	16 12 6	15 2 6	15 16 9	17 7 6	9 0 0	6 16 3	8 7 6	9 8 9	9 7 6	11 0 0	11 13 9	12 10 4
March	15 3 9	15 8 9	15 15 3	17 0 0	9 6 3	6 2 6	8 6 3	9 8 9	9 5 0	11 0 0	12 7 6	12 8 6
Ave age	15 14 8	15 13 10	15 15 0	16 13 8	12 17 9	6 11 9	8 6 2	9 17 10	10 2 9	10 2 6	11 11 6	12 19 1

Source — Annual Review of the O Laced, O L and Oil Cakes Markets published by Frank Fehr & Co. London.
 Prices for 1937-38 are based on weekly cables received from the High Commissioner for India, London.

APPENDIX XVIII

Average monthly premiums for Calcutta over Plate Insured in London

(Vide Appendices XVI and XVII)

(Per ton)

Month	1926 27	1927 28	1928-29	1929 30	1930 31	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37	1937 38
April	£ s d 2 5 0	£ s d 0 11 3	£ s d 2 5 0	£ s d 2 2 6	£ s d 1 3 9	£ s d 1 15 0	£ s d 1 16 3	£ s d 1 3 9	£ s d 1 11 3	£ s d 2 0 0	£ s d 1 13 9	£ s d 1 16 6
May	£ s d 2 1 3	£ s d 2 1 3	£ s d 1 16 3	£ s d 1 16 3	£ s d 1 2 6	£ s d 1 16 3	£ s d 1 11 3	£ s d 1 8 9	£ s d 1 12 6	£ s d 2 5 0	£ s d 1 12 6	£ s d 1 10 6
June	£ s d 2 0 3	£ s d 2 1 3	£ s d 2 0 6	£ s d 1 10 0	£ s d 1 3 9	£ s d 1 12 0	£ s d 1 11 9	£ s d 1 0 6	£ s d 1 10 6	£ s d 2 6 0	£ s d 1 12 0	£ s d 1 7 3
July	£ s d 1 17 6	£ s d 1 16 3	£ s d 2 1 3	£ s d 1 2 6	£ s d 1 12 6	£ s d 2 6 3	£ s d 1 12 6	£ s d 0 16 3	£ s d 1 2 6	£ s d 2 6 0	£ s d 1 15 0	£ s d 1 18 0
August	£ s d 2 2 8	£ s d 1 12 6	£ s d 2 7 0	£ s d 1 1 3	£ s d 2 1 3	£ s d 2 0 0	£ s d 2 2 9	£ s d 0 10 6	£ s d 1 1 3	£ s d 2 5 0	£ s d 1 17 9	£ s d 2 0 0
September	£ s d 1 12 6	£ s d 1 7 6	£ s d 2 7 6	£ s d 0 3 9	£ s d 2 0 6	£ s d 3 2 6	£ s d 2 1 3	£ s d 0 10 0	£ s d 1 1 3	£ s d 2 0 0	£ s d 1 17 6	£ s d 1 18 3
October	£ s d 1 10 0	£ s d 1 12 6	£ s d 2 13 9	£ s d 0 15 0	£ s d 2 7 0	£ s d 2 6 3	£ s d 2 1 3	£ s d 0 17 6	£ s d 1 2 6	£ s d 2 1 3	£ s d 1 18 9	£ s d 1 16 9
November	£ s d 1 7 6	£ s d 1 15 0	£ s d 3 8 9	£ s d 1 18 9	£ s d 2 6 3	£ s d 2 1 3	£ s d 1 16 3	£ s d 1 10 6	£ s d 1 15 0	£ s d 2 7 6	£ s d 2 5 0	£ s d 2 2 9
December	£ s d 1 15 0	£ s d 1 13 9	£ s d 4 5 0	£ s d 1 13 9	£ s d 2 13 9	£ s d 1 17 6	£ s d 2 3 9	£ s d 1 15 0	£ s d 2 3 9	£ s d 1 18 9	£ s d 2 8 9	£ s d 2 11 0
January	£ s d 1 3 9	£ s d 2 6 0	£ s d 3 8 9	£ s d 3 1 3	£ s d 3 7 6	£ s d 2 8 9	£ s d 2 6 0	£ s d 1 15 0	£ s d 2 10 0	£ s d 1 18 9	£ s d 2 7 6	£ s d 2 4 9
February	£ s d 1 10 0	£ s d 2 7 6	£ s d 3 7 6	£ s d 1 15 0	£ s d 2 10 6	£ s d 2 15 0	£ s d 1 17 6	£ s d 1 13 9	£ s d 2 7 6	£ s d 1 15 0	£ s d 2 5 3	£ s d 1 19 9
March	£ s d 2 8 9	£ s d 2 6 3	£ s d 2 16 3	£ s d 1 6 3	£ s d 2 1 3	£ s d 2 15 6	£ s d 1 8 9	£ s d 1 10 6	£ s d 1 17 6	£ s d 1 16 3	£ s d 2 0 0	£ s d 1 8 9
Average	£ s d 1 16 8	£ s d 1 19 2	£ s d 2 14 10	£ s d 1 13 10	£ s d 2 2 6	£ s d 2 4 9	£ s d 1 17 6	£ s d 1 4 2	£ s d 1 12 11	£ s d 2 1 5	£ s d 1 19 6	£ s d 1 17 9
Percentage of premium to Plate price.	11	12	17	9	16	25	22	12	16	20	17	15

APPENDIX XIX

Number of occasions on which the weekly closing "futures" price was at a premium (+) or discount (—) as compared with "ready" prices at Calcutta

Month	1931-32		1932-33		1933-34		1934-35		1935-36		1936-37		1937-38		Monthly total for seven seasons.	
	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very	May Del. very	Sept. Del. very
April	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
May	4 0	4 0	5 9	4 0	4 1	5 0	2 2	4 0	2 3	4 0	4 0	4 0	0 3	3 0	21 8	28 0
June	4 1	5 0	2 9	3 0	3 0	4 0	4 0	4 0	3 1	4 0	5 0	5 0	2 1	4 0	23 2	29 0
July		4 0		4 0		4 0	0 1	5 0			0 1	4 0		4 0	0 2	28 2
August	2 0	4 0	4 0	5 0	4 0	4 0	2 2	4 0	0 4	0 2	0 4	4 0	0 3	2 0	12 13	26 2
September	5 0	5 0	4 0	4 0	4 0	3 1	0 4	4 0	5 0	1 1	0 5	4 1	0 4	4 0	28 13	25 4
October	4 0	2 1	4 0	3 0	5 0	5 0	0 5	4 0	2 0	0 1	0 4	4 0	0 4	3 1	15 13	21 4
November	5 0		5 9		3 1		0 4		1 3		0 2		0 3		14 13	
December	4 0		4 0		0 4		3 1		4 0		0 2		0 3		15 10	
January	4 0		5 9		0 3		1 4		4 0		0 2		0 2		14 11	
February	5 0		4 0		1 3		3 0		4 0		0 4		1 2		18 9	
March	4 0		4 0		3 1		2 1		5 0		0 4		0 3		18 9	
Annual Total	45 1	24 1	45 0	29 16	23 1	19 2	25 0	34 10	12 6	9 31	25 1	3 30	23 1	184 116	164 10	7 0

APPENDIX XX

Number of occasions on which the weekly closing "future" price was at a premium (+) or discount (—) as compared with "ready" prices at Bombay

Month	1931-32		1932-33		1933-34		1934-35		1935-36		1936-37		1937-38		Monthly total for seven seasons.	
	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very	May Deli very	Sept. Deli very
April	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
May	3 2	4 0	5 0	4 0	5 0	4 0	5 0	5 0	5 0	5 0	3 0	3 0	4 0	4 0	29 2	29 0
June	2 2	4 0	3 1	4 0	5 0	4 0	5 0	5 0	5 0	5 0	4 0	5 0	4 0	5 0	27 4	32 0
July	1 0	5 0		4 0	1 0	5 0	0 4	5 0	3 0	4 0	0 3	4 0	2 0	3 0	7 7	30 0
August	4 0	4 0		5 0	4 0	3 1	0 4	4 0	5 0	5 0	0 4	4 0	2 2	5 0	15 10	30 1
September	2 1	0 2	4 0	4 0	4 0	4 0	0 5	5 0	5 0	5 0	1 4	5 0	0 4	3 0	15 13	29 1
October	5 0		5 0	4 0	5 0	4 0	2 2	3 1	4 0	4 0	2 1	3 0	1 3	2 0	20 7	20 3
November	4 0		5 0		4 0		5 0		5 0		4 0		4 1		32 1	
December	4 0		4 0		4 0		4 0		5 0		3 0		1 1		26 1	
January	1 0		4 0		5 0		5 0		5 0		3 1		0 3		28 4	
February	4 0		4 0		3 2		5 0		4 0	1 0	5 0	4 0	0 4	4 0	22 5	9 0
March	4 0		5 0		3 1		4 0		5 0	5 0	4 0	4 0	3 1	4 0	27 2	17 0
Annual Total	38 5	20 3	41 1	33 0	45 4	30 1	39 15	31 1	55 0	38 0	31 13	34 0	22 21	34 0	272 50	220 5

APPENDIX XXL

Specimen Agreement to secure a Cash Credit on Goods deposited

THE * * * BANK LIMITED

No _____

Amount Rs _____

Name _____

The * * * Bank Limited (hereinafter called "the Bank") having at the request of Messrs _____ (hereinafter called "the Borrowers") opened or agreed to open in the Books of the Bank at _____ a Cash Credit Account to the extent of Rs _____ with the borrowers to remain in force for a period of _____ months from the _____ day of _____ 193____, and to be secured by goods to be pledged with the Bank

IT IS HEREBY AGREED between the Bank and the Borrowers (the borrowers agreeing jointly and severally) as follows —

1st — That the goods and merchandise mentioned in the Schedule hereto which have been already deposited and the goods and merchandise which shall be hereinafter deposited with the Bank under this agreement (hereinafter called "the Securities") shall remain and be placed in the exclusive possession and under the exclusive control of the Bank and in such a manner that such possession and control shall be apparent and indisputable. Provided that the Bank shall not be responsible for the loss, destruction, or deterioration of the goods deposited by any means

4th — That all securities as aforesaid shall be insured against the fire risks by the Borrowers in some Insurance Office approved by the Bank to the full extent of the value of such Securities, that the fire policies shall either be taken out in the name of the Bank or be assigned to the Bank. Should the Borrowers fail to insure, the Bank shall be at liberty to effect such insurance at the expense of the Borrowers

5th — That a margin of _____ per cent at least to be fixed by the Bank from time to time in favour of the Bank, shall be always maintained by the Borrowers between the sum (including interest and other customary charges) for the time being due to the Bank on the said Cash Credit Account and the open market value of the Securities either by the deposit of further Security to be approved by the Bank, or by Cash Payment by the Borrowers, immediately on the market value for the time being of the securities becoming less than the amount equal to the balance then due to the Bank as aforesaid and the margin to be fixed and that in default of provision of such margin the whole amount due to the Bank on the said Cash Credit Account shall be immediately paid by the Borrowers if the Bank so requires

6th — That the interest at the rate of _____ per cent per annum shall be calculated on the daily balance due to the Bank of the said Cash Credit account

7th — That on the expiration of the said period of _____ months from the _____ day of _____ 193____ the Borrowers shall pay to the Bank the balance within the limit hereinbefore mentioned, then outstanding and owing to the Bank on the said Cash Credit Account inclusive of interest at the rate above mentioned to the date of payment.

8th — That if when called upon by the Bank to maintain such margin as aforesaid the Borrowers shall fail to do so, such balance of principal and interest monies as may be then due to the Bank, it shall be lawful for the Bank forthwith, or at any time thereafter and without any notice to the Borrowers to sell or otherwise dispose of all or any of the Securities and to apply the net proceeds of such sale towards the liquidation of principal and interest monies due to the Bank, together with all charges to be incurred by the Bank

9th — That if the net sum realised by such sale be insufficient to cover the amount so found due, the Borrowers promise and agree forthwith on production to them of the account so to be prepared and signed as aforesaid, to pay any further balance which may appear to be due by the Borrowers thereon

10th — Provided also that nothing herein contained shall be deemed to negative qualify or other use prejudicially affect the right of the Bank to recover from all or any of the parties, including the Borrowers liable on all or any of the Bills of Exchange, Drafts, Cheques, Promissory Notes or Bonds which may at any time be held by the Bank as Security or part Security against the said Cash Credit Account

11th — And it is hereby agreed that in the event of there being a surplus available after payment of all such principal and interest monies and all charges and expenses of the net proceeds of such sale of Security as aforesaid, it shall be lawful for the Bank to apply the said surplus as far as the same shall extend in or towards payment or liquidation of any and all other monies which shall or may be due from the Borrowers or any one or more of them to the Bank by way of Loans

14th — That the Borrowers shall bear all expenses incurred by the Bank in this connection such as the pay of Godownkeepers and Chouldars and the travelling allowances of Inspector, Managers Godownkeepers and other officers and all such expenses shall be debited to the Borrowers' account in due course

15th — That the Bank will always be at liberty to stop making advances at any time without previous notice and without assigning any reason even though the said limit of Rs ————— has not been fully availed of

In witness hereof the Borrowers have hereunto set their hands this ——— day of ——— 193 —, in the Christian year one Thousand Nine Hundred and ———

Schedule of Securities referred to in the foregoing Agreement

APPENDIX XXII

Approximate share of different agencies in the assembling of Linseed in the main producing areas of India

Provinces or State	Proportion taken by different agencies					
	United Provinces	Bihar and Orissa	Central Provinces	Bengal	Bombay	Hyderabad
	%	%	%	%	%	%
(1) Cultivators taking their own or fellow cultivators' produce	25	10	25	20	65	5
(2) Landlords or village merchants	50	20	40	30	30	35
(3) Itinerant merchants (<i>Bhoparis</i> and <i>Lodhis</i>)	20	60	30	50	15	40
(4) Wholesale merchants and crushers' buying agents	5	10	5			35
(5) Producers' co-operative societies						5
Total	100	100	100	100	100	100
						Average for India
						%
						20
						40
						25
						5
						100

APPENDIX XXIII

Market charges on Lunsed in certain assembling markets in the United Provinces
(Per 100 rupees.)

Items	Cawnpore.	Gorakhpur	Oral	Gonda	Benares.	Banda	Matera (District Bharat)	Banda (District Fatehpur)	Bharwa Sumerpur (Hamar P. S.)	Barhni (District Basti)	Average
	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P
<i>Payable by seller</i>											
Tolls and taxes (terminal tax octroi tolls, etc.)	0 10 8	0 1 3		0 6 3	2 15 6	0 10 8	0 10 0	0 2 6	0 2 9	0 8 2	0 10 3
Commission and brokerage	0 4 0	0 10 0			1 0 0				0 12 6		0 4 3
Handling and weight charges	1 12 9	0 7 6	1 1 0	0 15 0	0 5 0	0 7 6	0 12 8	1 3 9	1 0 3	0 9 5	0 13 10
Charges for other services	0 4 4	0 1 3	0 12 6	0 2 6	0 7 3	0 10 7	0 5 0	0 5 0	0 7 6	0 1 3	0 5 8
Chatties	0 11 0	0 1 11	0 4 8	0 7 6	0 1 8	0 4 5	1 4 0	0 5 8	0 8 9	0 3 2	0 6 10
Quality and weight allowances (Karda dhalis etc.)	4 6 0	2 13 0	1 9 0	2 8 0		2 8 0	2 8 0	1 14 0	0 5 0	1 14 0	2 0 6
Miscellaneous	1 11 0	3 9 10	0 8 3	3 0 9		1 9 0				1 2 9	1 2 4
Total payable by seller	9 11 9	7 12 9	4 1 2	7 10 6	4 13 3	6 2 2	6 7 6	3 14 11	3 5 9	4 6 0	6 11 0
<i>Payable by buyer</i>											
Commission and brokerage	1 9 0		0 12 0		1 0 6	1 12 6		0 12 0	0 12 0	0 12 0	0 11 10
Handling and weight ment	0 3 0	0 12 6	0 2 6		0 5 0				0 2 6		0 2 7
Miscellaneous											
Total payable by buyer	1 12 0	0 12 6	0 14 6		1 5 6	1 12 6		0 12 0	0 14 6	0 12 0	0 14 8
Grand Total	11 7 9	8 9 3	4 16 8	7 30 6	6 2 9	7 14 8	6 7 6	4 10 11	4 4 3	6 2 9	6 30 2

APPENDIX XXIV

Market charges on *Lapsed in certain assembling markets in Bihar and Orissa*
(Per 100 rupees)

Items	Marungauj (Patna)	Maharungauj (Patna)	Darbhanga	Sahibganj (Santhal Parganas)	Natwar (Shahabad)	Chupra	Average
<i>Payable by seller</i>	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P
Tolls and taxes (terminal tax, octroi tolls etc)	0 2 0	0 10 0				0 2 6	0 2 5
Commission and brokerage	2 8 0	1 4 0	1 0 0	0 12 0	0 10 0	1 0 0	1 3 0
Handling and weightment charges	0 7 6	0 7 6	0 2 8	0 15 2	0 6 0	0 3 9	0 7 1
Charges for other services	0 2 0	0 1 0	0 2 0	0 8 0		0 1 0	0 2 4
Charities	0 1 3	0 2 0	0 1 3	0 1 6	0 2 0	0 0 6	0 1 6
Quality and weight allowances (Karda, dhalla etc)	0 10 0	0 10 0	0 10 0	0 7 6		0 10 0	0 7 11
Miscellaneous						0 12 0	0 2 0
Total payable by seller	3 14 9	3 2 6	1 15 11	2 12 2	1 2 0	2 13 9	2 10 2
<i>Payable by buyer</i>		1 9 0			0 4 0		0 4 10
Commission and brokerage					0 0 8		0 0 5
Handling and weightment	0 0 5			0 1 7			
Miscellaneous							
Total payable by buyer	0 0 5	1 9 0		0 1 7	0 4 8		0 5 3
Grand Total	3 15 2	4 11 6	1 15 11	2 13 9	1 6 8	2 13 9	2 15 5

APPENDIX XXV

Market charges on Linseed in certain assembling markets in the Central Provinces, and Berar
(Per 100 rupees.)

Items.	Nagpur	Jubbulpore.	Sihora (District Jubbulpore).	Malkapur (District Buldana).	Average.
	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P
<i>Payable by seller</i>					
Tolls and taxes (terminal tax octroi tolls etc)	2 8 0	2 8 0	0 1 11	0 2 6	1 5 1
Commission and brokerage	0 12 0	0 4 0	1 0 0	0 14 2	0 11 6
Handling and weightment charges	0 7 6	0 5 0	0 10 0	0 6 8	0 7 2
Charges for other services					
Charities	0 0 4	0 2 6	0 2 6	0 0 8	0 1 6
Quality and weight allowances (<i>Karda dhalia</i> etc)			0 2 6		0 0 8
Miscellaneous					
Total payable by seller	3 11 10	3 3 6	2 0 11	1 8 0	2 10 0
<i>Payable by buyer</i>					
Commission and brokerage	0 4 0				0 1 0
Handling and weightment	0 2 6	0 8 0	0 8 0		0 4 8
Miscellaneous					
Total payable by buyers	0 6 6	0 8 0	0 8 0		0 5 8
Grand Total	4 2 4	3 11 6	2 8 11	1 8 0	2 15 8

APPENDIX XXVI

Market charges on Laseed in certain assembling markets in the Bombay Presidency

(Per 100 rupees)

Items.	Chaba gaon (District East Khandesh)	Byapur	Dondcha (District West Khandesh).	Belapur (District Ahmed nagar)	Lasal gaon (District Nasik.)	Average.
	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P	Rs. A P
<i>Payable by seller</i>						
Tolls and taxes (terminal tax, octroi tolls, etc.)	0 1 8	0 15 0				0 3 4
Commission and Brokerage	0 11 8	1 4 0	1 0 0	1 0 0	1 4 0	1 0 9
Handling and Weighment charges.	0 3 4	0 4 2	0 4 0	0 8 0	0 5 0	0 4 11
Charges for other services						
Charities	0 2 4	0 4 2	0 6 0	0 2 0	0 2 6	0 3 7
Quality and weight allow- ances (Karda, dhalia etc etc.)						
Miscellaneous						
Total payable by seller	1 4 0	2 11 4	1 10 0	1 10 0	1 11 6	1 12 1
<i>Payable by buyer</i>						
Commission and brokerage						
Handling and weighment						
Miscellaneous						
Total payable by buyer						
Grand Total	1 4 0	2 11 4	1 10 0	1 10 0	1 11 6	1 12 1

APPENDIX XXVII

Market charges on *Licensed* in certain assembling markets in Bengal, *Poynab* and *Central India* and *Rajputana States*
(Per 100 rupees)

Items	Chudanga (Bongal)	Pathan kot (Punjab)	Bhopal (Central India)	Satna (Rewah Central India)	Dewas Senior (Central India)	Kotah (Rajpu- tana)	Average of Central India and Raj- putana States
	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P
<i>Payable by seller</i>							
Tolls and taxes (terminal tax, octroi, tolls etc.)	1 14 0	1 8 0	0 1 3	3 2 0*	1 0 0	0 13 8	0 12 10
Commission and brokerage	0 7 6	0 5 0	1 13 5	0 4 0	1 1 6	0 5 0	0 8 5
Handling and weight charges		0 1 0	0 1 10	0 0 8			0 13 3
Charges for other services		0 1 0	0 10 0	0 0 7	0 1 3		0 0 7
Charities	0 1 11						0 3 0
Quality and weight allowances (Karia Chalks etc.)	0 6 3			1 4 0	1 0 0		0 11 3
Miscellaneous							
Total payable by seller	2 13 8	1 15 0	2 10 6	4 12 6	3 11 9	1 2 8	3 1 4
<i>Payable by buyer</i>							
Commission and brokerage						0 5 0	0 1 3
Handling and weight			0 5 8	0 6 3		0 5 0	0 4 3
Miscellaneous				0 0 6			0 0 1
Total payable by buyer			0 5 8	0 6 9		0 10 0	0 5 7
Grand Total	2 13 8	1 15 0	3 0 2	5 3 3	3 11 9	1 12 8	3 6 11

* Permit tax is levied @ Rs 3 % on licensed entering the State from outside

APPENDIX XXIX

Average of market charges on Linseed in assembling markets in different provinces and States in India
(Per 100 rupees)

Items	United Provinces (10 markets) (Appendix XXIII)	Bihar and Orissa (6 markets) (Appendix XXIV)	Central Provinces and Berar (4 markets) (Appendix XXV)	Bombay (5 markets) (Appendix XXVI)	Punjab (1 market) (Appendix XXVII)	Bengal (1 market) (Appendix XXVIII)	Central India and Rajputana States (4 markets) (Appendix XXVII)	Hyderabad (7 markets) (Appendix XXVIII)
	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P	Rs A P
<i>Payable by seller</i>								
Tolls and taxes (terminal tax octroi tolls, etc)	0 10 3	0 2 5	1 5 1	0 3 4			0 12 10	0 4 4
Commission and brokerage	0 4 3	1 3 0	0 11 6	1 0 9	1 8 0	1 14 0	0 8 5	1 7 1
Handling and weight charges	0 13 10	0 7 1	0 7 3	0 4 11	0 5 0	0 7 0	0 13 3	0 4 0
Charges for other services	0 5 9	0 2 4			0 1 0		0 0 7	
Charities	0 6 10	0 1 5	0 1 6	0 3 7	0 1 9	0 1 11	0 3 0	0 1 1

Quality and weight allowances (Kardā, dhalla etc)	2 0 6	0 7 11	0 0 8		0 8 3	0 11 3
Miscellaneous	1 2 4					
Total Payable by seller	5 11 3	2 10 2	2 10 0	1 12 7	2 13 8	3 1 4 - 0 5
Payable by buyer						
Commission and brokerage	0 11 10	0 4 10	0 1 0			0 1 3
Handling and weight	0 2 7	0 0 5	0 4 3			0 4 3 0 3 5
Miscellaneous						0 0 1 0 0 2
Total Payable by buyer	0 14 5	0 5 3	0 5 8			0 0 7 0 3 7
Grand Total	0 10 2	2 15 5	2 16 8	1 12 7	2 13 8	3 6 11 2 4 0

APPENDIX XXX

Moisture content in commercial samples of Linseed collected from different parts of India

Province or State	Moisture in cleaned seed		
	Maximum %	Minimum %	Average %
Assam			8.33
Bengal	8.18	5.83	7.47
Bihar (North)	8.45	5.11	6.40
Bihar (South) and Orissa	7.69	4.82	5.98
Bombay Presidency	7.52	4.95	5.89
Central India States	8.03	5.56	6.65
Central Provinces (East)	7.93	5.52	6.69
Central Provinces (Central)	7.31	5.40	6.16
Central Provinces (West) and Berar	7.84	4.48	6.11
Hyderabad State	7.38	5.47	6.52
Kashmir State	6.30	5.35	5.90
Madras			6.15
Punjab	8.36	5.19	6.83
Rajputana	7.29	5.77	6.33
United Provinces (North-east)	7.51	5.14	6.58
United Provinces (Central)	7.13	5.74	6.20
United Provinces (South west)	6.81	5.60	6.12
At Bombay	7.10	5.82	6.39
At Calcutta	7.25	5.61	6.45
From shipments for export from Bombay	7.36	6.03	6.69

APPENDIX XXXII
Comparison of Linseed contracts of certain associations and mills in respect of the bases of refraction, standards for Bold Linseed and methods of sampling

basis in respect of the bases of refraction, standards for Bold linseed and methods of sampling						
	A. Calcutta Trading Associations	B. Bombay Trading Associations	C. A Calcutta Oil Mill	D. Another Calcutta Oil Mill	E. A mill in the United Provinces	F. Incorporated Oil Seed Association, London
Basis of admixture (refraction)	5% refraction Customary allowance upto 7% Note—If refraction exceeds 7 per cent a special allowance is charged which is mutually settled but is not specified in the contract.	4% refraction Mutual proportionate allowance upto 4%. For refraction over 4% cleaning charges at Rs. 3 8 0 per 100 bags to be paid by seller.	5% refraction allowance to seller for loss refraction down to 3%. For refraction over 5% Customary allowance upto 7% Over 7% sellers to refund within a week, failing which buyers have the option (a) of cleaning the goods themselves at sellers expense (b) cancelling the contract (c) reworking the goods and buying against sellers or (d) accepting the goods with special allowance	5% refraction Customary allowances upto 9%. Over 9% buyers have the option of charging a special allowance or rejecting the goods.	4% refraction mutual For refraction over 5% cleaning charges at Rs. 6 1 0 per bag Linseed containing 9% to 12% refraction accepted with quality allowance and cleaning charges.	Basis Pure Allowance equal to the percentage of admixture 1 or less than 92% pure linseed, an additional allowance to the buyer equal to the excess of calculated allowance over 4%
Foreign matter ..	Upto 4% allowance at half value. Excess over 4% allowance at full value.	Upto 2% allowance at half value. Excess over 2% allowance at full value.	Same as A	Same as A and C	For Rapeseed, Mustard Tilled and Jam-based allowance at half value and other oilseeds at full value.	Booked as half contract price
Discrepancy matter (Outside other than Linseed)						valueless.

Damaged Grains	10% free. From 10% upto 8% allowance at half value and over 8% at full value. For discoloured grains* allowance at one-fourth value	Nothing free except for damaged seeds at half value and for slightly damaged seeds at one-fourth value. Discoloured and touched seeds—1% free, and for over 1% allowance at one-eighth value.	Allowance for dead burnt and damaged seeds at full value (including damaged seeds) 1% free. From 1% to 6% allowance at half value and over 6% at full value	Same as A	Allowance for dead seed at full value. For damaged seeds at half value and for slightly damaged seeds at three-eighths value.
Size of grain	Contracts refer to small linseed only	Small linseed upto 10% in bold brown) seeds to be accepted with out allowance. For over 10% and upto 3-5% small grain the buyer to reserve from the seller an allowance proportionate to the percent age of small seeds at the difference between the rates for bold and small linseed. If small grain exceed 35% buyer to have the right to reject.	For bold linseed upto 160 grains per gramme to be accepted	For bold linseed upto 152 grains per gramme to be accepted	* Special Bold Beans 110 grains per gramme with allowance at 2 pias per grain per ounce for every grain over 110 upto 125. Parcels containing more than 125 will be treated as bold Beans 125. Bold Beans 125 grains to a gramme with allowance at 2 pias per grain per ounce for every grain over 125 upto 145. Parcels containing more than 145 grams will be treated as Small No provision
Page	By Bona (appeal) from 8 to 10 bags (For details see page 134)	By hand from 10 bags (for details see page 135)	By Bona from 8 to 10 bags.	By Bona from 8 to 10 bags	Small No provision
Unit	New B Twills	New B Twills or Heavy G (weight should not be less than 24 lbs) 25 tons for futures contracts	B Twills	B Twills	New Heavy C bags. Buyers may supply their own bags or sellers may provide their bags in exchange of an equal number of empty bags from buyers.
Delivery months	10 tons for future contracts May and September for futures contracts	May and September for futures contracts			24 lb B Twill bags and/or 24 lb Heavy C bags at sellers option at an allowance to buyers of 1/4 per bag

* In the contract form of our association only

Bold Calcutta linseed—
Beans 145 grains to a gramme. Excess allowed for at the rate of 0.15% of the contract price for bold seed for every grain over 145 with a maximum of 1 1/2%.

Bombay Bold linseed—
Not to contain more than 25% small grains. Any larger proportion to be allowed for at the rate of 0.05% for every 1% of such excess.

APPENDIX XXXIII

Lanseed Contract used by an Oil Mill at Calcutta.

Bought Note

Contract No _____

19 .

Messrs

DEAR SIRs,

_____ have this day bought by your order and for your account from
 Messrs _____ Tons small grains Up-country Lanseed of
 the average quality of the Season at the time of delivery at Rs _____
 (Rupees _____) per Bazar Maund, guaranteed
 not to exceed one quarter per cent Rape Seed and/or Mustard Seed
 Delivery to be given and taken from _____ Station _____ Railway
 as follows _____

Refraction guaranteed as follows .

Basic 5 per cent dirt

Dead burnt and fully damaged seeds as full dirt

Country damaged 1 per cent free excess upto 6 per cent as $\frac{1}{2}$ dirt and over 6 per cent
as full dirtDiscoloured grains as $\frac{1}{2}$ dirtOleaginous other than lanseed as $\frac{1}{2}$ dirt upto 4 per cent excess as full dirtIn Bold Lanseed 150 grains to one gramme free for excess on allowance of
per Maund to be paid by sellers

Should refraction exceed 7 per cent buyers have the option to decline
 delivery and redirect the lot to _____ Dock at sellers' risk and expense
 Allowance to be made by buyers for less refraction down to 3 per cent below
 which no allowance will be made

Bags—New B Twill bags

Terms—Cash on delivery

This contract is made under the conditions detailed below

Brokerage at (0 0 6) six pies per maund payable by sellers to be
 deducted from sellers' Bill by the buyers

We are, Dear Sirs,

Yours faithfully,

Broker

Accepted

GENERAL SALE CONDITIONS

- 1 Refraction guaranteed (5) five per cent customary allowance for any excess upto seven per cent over that sellers to reclean within a week failing which buyers to have the following option, viz —
 Of recleaning the seed themselves at sellers expense cancelling that portion of the contract tendered or buying against sellers in the open market at best rates Should however the buyers desire to take delivery in case the seed refracts over seven per cent they are to have the option of doing so with customary allowance
- 2 Buyers to have the option of weighing and sampling ten per cent. of the whole should delivery be at Howrah Railway Station, and to accept any tenders from sellers by railway receipts or other wise
- 3 The seed to be in sound merchantable condition
- 4 Refraction to be made at buyers office or their Mill at _____
- 5 Any disputes as to quality delivery etc under this contract to be settled by European arbitration but buyers weights and refractions to be unconditionally accepted by sellers

APPENDIX XXXIV

Contract Form of the Grain Merchants' Association, Bombay

THE GRAIN MERCHANTS' ASSOCIATION

Contract No _____

Bombay, _____ 193

Broker _____

Messrs _____

Bombay

DEAR SIRS,

We have this day sold/bought to you _____
 _____ Tons/Bags _____ only 1 per cent
 more or less of _____
 Fair average quality of the season at Rs _____ and 1 *Dokda*
Dharmada per Cwt net weight free Railway Station Bombay or to be
 delivered at Buyers' Godown

Bagging—New Calcutta No 2 twills or heavy G Bags weight not less
 than $2\frac{1}{2}$ lb In case of godown delivery, bagging shall be the same as in
 Railway Delivery/Terms

Delivery _____ Seller's option Buyers shall not be
 obliged to accept tender of less than 100 bags at a time

Buyers shall have the option to refuse Railway Receipt if not tendered
 9 days before the due date of the contract in the event of the
 contract being more than 50 tons each 50 tons to be regarded as
 separate contract

1 refraction—4 per cent reciprocal

Payment—Advance and final payment shall be made according to the
 rules of the General terms and conditions

Brokerage— $\frac{1}{4}$ per cent to be paid by the sellers in all contracts except
 in wheat in which $\frac{1}{2}$ per cent to be paid by sellers

The above mentioned quantity contracted for to be delivered to

This contract is subject to the rules of the GENERAL TERMS AND
 CONDITIONS of Delivery contract as settled by the Grain Merchants' Asso-
 ciation and buyers of which the parties admit that they have knowledge and
 notice and which terms shall be deemed to be incorporated in and to form part
 of this contract

Yours faithfully,

Seller's/Buyer's Signature _____

Broker's Signature _____

APPENDIX XXXV

Contract Form of the Marwadi Chamber of Commerce Ltd, Bombay

THE MARWADI CHAMBER OF COMMERCE LTD, BOMBAY.

OFFICIAL CONTRACT FORM

Bombay,-----193 .

Broker-----

Messrs-----

Bombay.

DEAR SIRs,

We have this day bought/sold from you, subject to the Rules, Regulations and Bye laws of the Marwadi Chamber of Commerce Ltd-----
 tons of----- at Rs.----- per cwt Brown Bold Lunseed,
 May, September Delivery delivered at buyer's godown, or Railway Station,
 Bombay

Terms

Description--Fair average quality of the season-----

Delivery-----at seller's option

Refraction--Lunseed --

4 per cent With usual allowance

upto-----

Bagging--Net in new Calcutta 2 Twill bags weighing 2½ lb

Payment--90 per cent cash against Railway Receipt goods

Brokerage--½ per cent to be paid by the seller

This contract shall not be cancelled

Buyer's/Seller's signature-----

APPENDIX XXXVI

Contract Form of the Calcutta Wheat and Seeds Association

CALCUTTA WHEAT AND SEEDS ASSOCIATION

SOLD NOTE

Contract No

Calcutta

19

DEAR SIRs,

We have this day SOLD to you the following goods --

(-)	tons of new crop	Average quality
of the season 19	at Rs	annas and pies
Bazar Maund including gunny bags		per

Refraction to be drawn by

(1) Sellers to tender the above goods and buyers to take delivery from Howrah or Kidderpore Docks between the 10th and the last day of the month of

(2) To be delivered in dry sound and merchantable condition in new bag

(3) Each bag to contain bazar maunds nett or any quantity buyers may require for which only payment is to be made

(4) Sellers must be present at the time of delivery to inspect the weighing and sampling should they fail to do so after notice to sellers buyers will weigh and sample with a usual Railway working hours and sellers must abide by the result

(5) Each delivery to form a portion of this contract, but no lot of less than 5 tons to be tendered

(6) Refraction guaranteed five per cent with customary allowance for any excess up to seven per cent

(7) The presence of stone or lunlar throughout a parcel of wheat or seeds shall entitle the buyers to reject the parcel

(8) Buyers to have the option of weighing the whole parcel or taking at an average weight as customary

(9) In taking weight bags one seer or more in excess of the stipulated weight not to be accepted in average

(10) The refraction of the sealed samples representing deliveries to be ascertained at buyers office within four days after delivery failing which three days notice to be given to the defaulting party on the expiration of which term the refraction to be referred to arbitration whose decision shall be final

(11) On every Monday subsequent to the date of this contract up to the due date either party shall pay to the other (as the case may be) the difference between the contract price and the market rate prevailing at the close of the preceding day and this contract shall continue at the latter rate. In case of default of such payment the defaulting party shall be deemed to have committed a breach of the contract. Such payment shall be noted on the back of this contract. If any Monday be a public holiday payment shall be made on the preceding business day

(12) Terms of payment.

(a) In the event of tender of Railway Receipts the buyers (at the option of the sellers) shall pay 90 per cent. of the value at the time of the making over of the Railway Receipt or within 45 hours thereafter. The balance shall be paid within a month from the making over of the Railway Receipt and in case of default the buyers shall pay interest at the rate of 12 per cent per annum from the expiry of the month up to the date of payment.

(b) In the event of Delivery Order being handed over the buyers shall pay for and take delivery, of the goods at any time within the period of this contract.

(13) Delivery Orders shall be transferable by endorsement and the person or firm originally issuing the delivery order shall be bound to deliver the goods to the ultimate holder against payment of price.

(14) Sellers shall be liable to pay demurrage from the day next after the date of tender of Railway Receipt or delivery order, subsequent demurrage shall be paid by the buyers.

(15) When Contracts fall due on Sunday or other holidays the last date of delivery shall be the preceding business day.

(16) Any dispute arising out of or under or in any way relating to this contract shall be decided by the arbitration of the Calcutta Wheat and Seeds Association under its rule in force at the time of the arbitration.

N.B.—Brokerage at 8 annas per ton to be paid by sellers and buyers each without any abatement, contract cancelled or not cancelled goods delivered or not delivered.

Broker

Yours faithfully,

APPENDIX XXXVII

Typical Exporters Contract

BOUGHT NOTE

Contract No

Calcutta,

193

KANTAPUKUR DELIVERY

To Messrs

CALCUTTA.

We have this day *BOUGHT* from you the following goods —

ons of 2240 lbs say (	on) or
bags say (	bags)
average quality of the season	at the time of delivery,
1 per cent more or less to be delivered at Kantapukur	
at Rs	(say Rs)
per maund of 82½ lb nett bags included	

Refraction guaranteed as stated on back of this contract

1 Goods to be delivered in dry sound merchantable condition in new single B Twill bags of 2½ lb

2 Each bag to contain bazar maunds 2 seers 10 nett for which only payment is to be made

3 If any parcel bears other shipping marks than those of the buyers the buyers to have the option of re-bagging and/or re-marking same, charging sellers with all expenses and any demurrage that may be incurred or of rejecting the parcel unless sellers supply new bags and pay marking charges

4 There is no tender unless the goods are at Kantapukur and are in every way in terms of Contract

5 Each tender to form a portion of this contract but buyers have the option of refusing to accept tender of less than 5 tons or of accepting same at an allowance of one anna per maund against sellers

6 The goods to be despatched to Kantapukur and to be rendered available for delivery there during the day time under the ordinary rules of the Port Trust Railway and buyers to take delivery within 15 days Should buyers fail to take delivery within 15 days sellers may then give buyers 7 clear days' notice in writing to take delivery and if delivery is not effected within this time the weight is to be considered as being in accordance with invoice weight in case of Railway Receipt, and correct weight in case of delivery orders. A tender made after 1 P.M. on any business day shall not be considered a valid tender on that day

7 Sellers to tender the goods to the buyers in terms of Clause 6 but to remain responsible for demurrage for one week subsequent to date of tender (Sundays and other non-demurrage days excluded) and in addition to pay to buyers for a further period of three weeks the difference if any between the lowest rate the Port Commissioners may be charging and the actual demurrage due on the tender

In case of dispute as regards quality refraction or condition of the goods demurrage to be charged just as if the tender was made on the day of the settlement

8 Buyers have the option of weighing the whole parcel or of taking average weights In the latter case 5 per cent of the bags to be weighed Buyers to choose the bags for weighing purposes Should the difference

between the heaviest and lightest bag out of every 5 bags so weighed be more than one seer per bag a further 20 per cent of the bags to be weighed and charges at the rate of Rs 1 8 0 per hundred bags to be paid by sellers

9 Sellers to pay repacking charges at the rate of Rs 4-8 0 per 100 bags on lots containing bags varying from the agreed weight by more than one seer per bag

10 Sellers may be present to inspect weighing and sampling Should they after 48 hours from date of posting written notice fail to attend buyers can proceed to weigh and sample themselves and sellers must accept Buyers' weights and the sample drawn by them as representing the parcel

11 Should the goods tendered not be in terms of contract Buyers have the following options —

- (a) Of cancelling that portion of the contract
- (b) Of rejecting the parcel and buying against sellers or charging them the difference in price between the contract rate and the market value on the day of rejection
- (c) Of taking the goods with an extra allowance to be fixed by buyers over and above the scale of allowances on reverse
- (d) Of reclaiming the goods themselves at sellers expense i.e., Rs 6-8 0 per cent bags

12 The presence of stones or lumps of earth entitles buyers to reject the lot tendered

13 If buyers find after making the final analysis that the goods contain more refraction than that contracted for they shall be at liberty to charge sellers cleaning charges at the rate of Rs 6 8 0 (Rupees six annas eight) per 100 bags

14 Samples to be drawn by buyers by *bomah* and to be sealed by both Buyers and Sellers The refraction of such samples to be made at Buyers office in Calcutta within ten days after weights have been taken If after three days notice Sellers fail to attend Buyers will proceed to analyse the sample in the sellers absence and the result shall be final

15 In the event of failure to deliver or of short deliveries Buyers to have the following options —

- (a) To claim and recover from Sellers the difference between Contract price and the market rate on the business day next following the last day for tender
- (b) To buy against sellers and recover from sellers all losses and damages sustained

16 If the period during which the tender is to be made shall expire on a Sunday or a Chamber of Commerce holiday the last day for tender shall be the business day next after such non business day

17 Should the goods be tendered in bags of a different or inferior quality to those contracted for such bags shall be rejected and sellers shall pay the buyers Rs 5 8 0 per 100 bags for cost of repacking and restacking plus market rate of the gunnies rejected or buyers to have the option to accept such different or inferior bags at an allowance to be fixed by the buyers

18 Bags must be properly sewn with strong twine and if goods packed in double bags both inner and outer bags must be sewn otherwise sellers shall pay buyers for the expense of resewing at the rate of Re 1-4-0 per 100 bags in the case of single bags and Rs 2-8 0 for double bags

19 Terms of payment cash after delivery Conditions in the contract as to delivery or otherwise are not affected by acceptance of Railway Receipt as security for advance given

20 Buyers may appropriate from the money payable to sellers the amount of any outstanding bills they have against the seller

21 Brokerage at the rate of six pies per maund to be paid by sellers without any abatement contract cancelled or not cancelled goods delivered or not delivered any deductions or durtures eventually allowed being entirely optional to the brokers When delivery is given such brokerage to be deducted by the buyers from value of goods delivered

22 The persons signing on behalf of the sellers declare that they have a right to make the above contract on behalf of the said firms and to agree to clause 24 on behalf of all the persons composing the firms they represent

23 The contents of this contract have been read and/or translated and are duly understood by the parties and the Sold Note given to Buyers

24 In the event of any dispute whatsoever arising under this contract, the same shall be referred for settlement in Calcutta to the Tribunal of Arbitration of the Bengal Chamber of Commerce whose decision it is expressly agreed shall be final and binding on both parties to this contract

25 Anything besides plain signature, in language other than English is null and void

Buyer

Banians

Per pro

Basis.

Lanseed

Basis 5 per cent durt

Dead burnt and fully damaged seeds as full durt.

Country damaged 1 per cent free, excess as $\frac{1}{2}$ durt up to 6 per cent, over 6 per cent, as full durt

Discoloured grains as $\frac{1}{2}$ durt.

Oleaginous other than Lanseed as $\frac{1}{2}$ durt up to 4 per cent., excess as full durt

In Bold Lanseed 152 grams to one gramme free, for excess an allowance of ——— per maund to be paid by the sellers

APPENDIX XXXVIII.

Extracts from the Incorporated Oil Seed Association (London) contract for East Indian Linseed to United Kingdom ports

Pure basis—sound delivered.

1 About-----Tons say-----Tons (of 2,240 lb each) shipment from-----as per Bill or Bills of Lading dated or to be dated-----by steamer or steamers direct or indirect with or without transshipment, via Suez Canal At-----per ton of 2,240 lb net, delivered sound, ex ship in-----, including the usual 2½ lb B twill bags, and/or 2½ lb heavy C bags at Sellers option at an allowance to the buyers of one half penny per bag

If bold Calcutta seed be appropriated, the Incorporated Oil Seed Association shall decide whether the seed comes under the denomination of bold or not. The bags shall be 145 grains to the gramme and any excess shall be allowed for at the rate of 0.15 per cent off the Contract Price for Bold Seed for every grain over 145 with a maximum allowance of 1½ per cent

If Bombay linseed be appropriated the seed shall be warranted to contain not more than 25 per cent of small grains, any larger proportion to be allowed for at the rate of 0.5 per cent for every 1 per cent of such excess, the percentage of small grains to be ascertained by The Incorporated Oil Seed Association

Payment

3 Payment to be made in London, on vessels reporting in-----, by net cash, in exchange for shipping documents and/or delivery order (the latter to be countersigned by Banker, Shipbroker, Captain or Mate if so required) and policy or policies of insurance effected with approved underwriters and/or approved letter of insurance (claims payable in London), interest at 5 per cent or at Bank of England rate if over 5 per cent at 10 A.M. on day of payment, to be allowed for unexpired portion of prompt of 21 days from vessel's reporting

Buyers to have the power of retaining a margin of 4 per cent accounting for the same on final settlement

Interest at 5 per cent or at average Bank of England rate if over 5 per cent to be paid on any balance due on final invoice from date of prompt up to date of settlement

5 Buyers to be allowed 24 hours from vessel's reporting to lodge documents and apply for delivery and the Company in whose dock the ship discharges shall be ordered by Sellers to weigh 5 sound and undamaged bags in every 100 as they rise from the ship and 2 in every 100 shall be emptied to ascertain the tare (said bags being weighed together). Buyers to give the sorting orders and failing their so doing the seed to be invoiced as sound, and sweepings to be for Buyer's account. Should the seed be sorted the damaged shall be taken by Buyers with the following allowances, viz—1st class damaged at 4 per cent, 2nd class at 8 per cent, 3rd class at 12 per cent, and lower class damages at a valuation or by arbitration. Slack bags to be weighed separately. Buyers to have the option of weighing the whole of the bags and the sweepings at their own expense

In the case of seed damaged by water, samples of wet seed shall be drawn in sealed bags in the usual way for arbitration, and if required by either party, duplicate samples of such wet seed shall be drawn in sealed bottles to be tested by The Incorporated Oil Seed Association for moisture content solely for the information of the arbitrators. The samples (or sample) when delivered to The Incorporated Oil Seed Association to become and be their absolute property, the charges for sampling, average weighing, taring, sorting and analysing to be divided between Buyers and Sellers. Port dues, if any, to be for Buyers account.

6 The percentage of admixture having been ascertained non Basis oleaginous substances shall be considered valueless and oleaginous as worth half the Contract price of the Linseed. The Basis shall be pure Linseed and the Buyers shall receive an allowance equal to the percentage of admixture so ascertained. If the percentage of pure Linseed is less than 92, there shall be an additional allowance to the Buyer equal to the excess of the calculated allowance over 4 per cent.

.

12 All disputes from time to time arising out of this Contract, including any question of Law appearing in the proceedings, whether arising between the parties hereto, or between one of the parties hereto, and the Trustee in Bankruptcy of the other party shall be referred to arbitration according to the Rules appended to this Contract.

.

Summary of Arbitration Rules

I Any dispute arising out of a contract shall be referred to arbitration in London, each party appointing one arbitrator. Arbitrators shall have the power, when they disagree, to appoint an umpire, whose decision is to be final.

II The arbitration fees to be paid by the party against whom the decision is given except when allowances are fixed by arbitration on country damaged or on seed damaged during the voyage in such cases the fees to be equally divided, also in other cases, where, in the opinion of the referees, they should be so treated.

III In the event of one of the parties refusing or neglecting to appoint an arbitrator or the arbitrators not agreeing to an award or appointing an umpire, or in the case of death or incapacity of an arbitrator or umpire, the Executive Committee of Incorporated Oil Seed Association shall appoint an arbitrator or arbitrators, or umpire, to fill the vacancy or vacancies.

IV All awards by arbitrators or an umpire shall be in writing and they shall have power to award the costs of and connected with the reference.

V In case either party shall be dissatisfied with the award a right of appeal shall lie to the Committee of Appeal of the Incorporated Oil Seed Association provided the necessary notice is given in time and the fees paid.

VI The appeal shall be determined by a Board of Appeal consisting of four members of the Committee of Appeal of the Association.

VII The parties to an arbitration or an appeal to the Committee of Appeal shall not be represented or appear by Counsel or Solicitor unless specially permitted to do so.

VIII The Board of Appeal shall confirm the Award appealed from unless not less than three of the members of the Board of Appeal decide to vary such Award.

IX No award by arbitrators or an umpire or the Board of Appeal shall be questioned or invalidated on the ground of their not being qualified or eligible unless objection is made in writing before the commencement of the hearing.

X Any notice may be delivered personally or left at the place where the party is to be considered to be carrying on business.

APPENDIX XXXIX

Approximate returns on stocks of Lenses held at Calcutta and Bombay.

	Calcutta.										Bombay										
	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37	1937 38	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37	1937 38	1931 32	1932 33	1933 34	1934 35	1935 36	1936 37	1937 38
Average April price per maund	4 9 7	3 12 10	3 10 3	4 7 2	4 9 6	5 2 7	6 1 5	5 5 1	4 5 0	3 13 7	4 10 9	4 13 5	5 4 10	5 5 4	5 5 1	4 5 0	3 13 7	4 10 9	4 13 5	5 4 10	5 5 4
Average August/September price per maund	3 15 3	4 3 4	4 8 11	4 14 6	4 11 0	5 11 7	6 1 9	5 3 4	4 9 4	4 12 6	4 15 5	4 13 7	5 12 6	5 15 0	5 3 4	4 9 4	4 12 6	4 15 5	4 13 7	5 12 6	5 15 0
Average December/January price per maund.	4 3 2	4 4 3	4 5 11	4 12 4	5 1 6	5 10 11	5 11 2*	4 10 1	4 8 5	4 5 6	4 15 1	5 3 7	5 8 0	5 12 1*	4 10 1	4 8 5	4 5 6	4 15 1	5 3 7	5 8 0	5 12 1*
Premium obtained in August/September over April price	— (0 10-4)	0 6 6	0 14 8	0 7 4	0 1 6	0 9 0	0 0 4	— (10 1)	0 3 7	0 14 11	0 4 8	0 0 2	0 7 8	0 0 8	0 3 7	0 14 11	0 4 8	0 0 2	0 7 8	0 0 8	0 0 8
Cost of carrying from April to August/September (6 months)	0 5 0	0 4 11	0 4 10	0 5 0	0 5 0	0 5 1	0 5 7	0 5 4	0 5 0	0 4 11	0 5 1	0 5 2	0 5 4	0 5 8	0 5 0	0 4 11	0 5 1	0 5 2	0 5 4	0 5 8	0 5 8
Net gain	0 1 7	0 0 10	0 2 4	0 3 3	0 3 6	0 3 11	0 3 11	0 1 5	0 1 5	0 10 0	0 0 5	0 0 5	0 2 4	0 2 4	0 1 5	0 10 0	0 0 5	0 0 5	0 2 4	0 2 4	0 2 4
Net loss	0 15 4	20 3 9	10 9 9	3 3 3	4 7 9	4 7 9	5 5 5	5 5 5	2 0 6	16 2 0	0 6 8	0 5 0	2 7 9	2 7 9	2 0 6	16 2 0	0 6 8	0 5 0	2 7 9	2 7 9	2 7 9
Premium obtained in December/January over April price	— (0 6 5)	0 7 5	0 11 8	0 5 2	0 8 0	0 8 4	— (0 6 3)	— (0 11 3)	0 2 8	0 7 11	0 4 4	0 5 2	0 3 2	— (0 2 11)	0 2 8	0 7 11	0 4 4	0 5 2	0 3 2	— (0 2 11)	— (0 2 11)
Cost of carrying from April to December/January (10 months)	0 8 3	0 7 9	0 7 8	0 8 3	0 8 3	0 8 7	0 9 3	0 8 9	0 8 1	0 8 2	0 8 2	0 8 5	0 8 9	0 9 3	0 8 1	0 8 2	0 8 2	0 8 5	0 8 9	0 9 3	0 9 3
Net gain	0 14 8	0 0 4	0 4 0	0 3 1	0 0 3	0 0 3	0 15 6	14 0	0 5 5	0 0 3	0 3 10	0 2 3	0 5 7	0 12 2	0 5 5	0 0 3	0 0 3	0 2 3	0 5 7	0 12 2	0 12 2
Net loss	19 9 9	0 5 0	4 3 0	0 3 0	0 3 0	0 3 0	15 9 9	23 4 9	7 8 9	0 4 9	5 1 1	2 9 9	6 0 6	12 8 9	7 8 9	0 4 9	5 1 1	2 9 9	6 0 6	12 8 9	12 8 9

* December average only

* December average only

† Godown rent we get and gunny allowance and interest at 5%

APPENDIX XL.

Approximate returns on stocks of Linseed held at upcountry markets.

	Average April price 1932-35	Average premium in August/ September over April price 1932-35	Cost of carrying upto August/ September (6 months)	Net gain	Net loss	Average premium in December over April price	Cost of carrying upto December (10 months)	Net loss
	Rs & P	Rs & P	Rs & P	Rs & P	Rs & P	Rs & P	Rs & P	Rs & P
Bihar (Central Provinces)	3 3 6	0 4 2	0 3 4	0 0 10 1 0%		0 2 5	0 5 4	0 2 11 5 7%
Nagpur (Central Provinces)	3 15 7	0 6 8	0 4 2	0 1 0 2 4%	0 0 7 1 0%	0 3 0	0 0 9	0 3 0 5 0%
Cannore (United Provinces)	3 8 1	0 3 1	0 3 8	0 0 4 0 0%		0 4 0	0 0 5	0 1 8 3 0%
Banala (United Provinces)	3 7 0	0 3 9	0 3 0			—(0 2 0)	0 3 0	0 7 6 13 6%
Bal ar Sharif (District Patna) Bihar	3 0 9	—(0 1 0)	0 3 0		0 4 0 0 9%	—(0 1 9)	0 4 7	0 0 4 11 0%
Bijapur (Bombay)*	3 4 5	0 9 8	0 4 4	0 5 4 10 2%		0 4 5	0 7 1	0 2 8 5 1%
Gallargh (Hyderabad)†	3 4 0	0 4 1	0 4 4		0 0 3 0 5%	0 0 4	0 7 1	0 7 5 14 1%

* Average 3 years 1933-35

† Average 4 years 1931-34

APPENDIX XLI.

Estimated stocks of *Lonasa*

(Tons)

Month	Upcountry markets			Hyderabad markets			Bombay			Calcutta		
	1935-36	1936-37	Average	1935-36	1936-37	Average	1935-36	1936-37	Average	1935-36	1936-37	Average
Apr 1	61 300	89 800	90 550	1 700	1 700	1 700	19 000	12 000	15 500	1 300	3 000	2 180
May	69 700	83 200	76 450	2 500	1 700	2 100	24 000	15 000	20 000	2 700	5 000	3 850
June	54 000	71 400	62 700	3 100	1 600	1 850	27 000	41 000	34 000	2 300	2 700	2 500
July	52 000	59 400	54 700	2 300	1 100	1 700	25 000	32 800	28 750	2 000	1 700	1 850
August	61 600	59 600	45 000	2 700	400	1 650	22 300	35 000	28 650	700	2 200	1 450
September	60 300	17 100	28 700	2 300	100	1 200	9 000	22 600	15 750	1 200	2 000	1 600
October	31 00	10 400	25 450	1 800	100	950	4 600	35 000	19 750	3 500	7 200	2 350
November	21 000	16 800	18 400	1 400	100	750	7 000	18 600	12 750	1 500	600	1 050
December	18 000*	11 600	13 800	1 400	100	750	7 000	15 600	11 250	800*	300	550
January	12 600	0 600	9 500	1 300		650	8 500	9 700	9 100	" 000	600	1 250
February	9 100	4 700	6 900	1 700	500	1 100	9 000	5 600	7 250	1 200	600	900
March	15 800	1 800	8 800	1 700	1 800	1 750	11 500	3 200	7 350	300	200	250

Source --Compiled from United circular published by the Imperial Council of Agricultural Research

* Nominal -- Estimate not available

APPENDIX XLII Results of analyses of certain samples of Refined Jaxcel 2 Oils imported and manufactured in India

	Sp Gravity	Acid value	Saponifi- cation value	Drying time hrs	Unsaponifi- able matter	Resin acid is	Ash	Iron	Manga- nese
1 Imported	0.939	11.80	190.0	6½ hrs	0.71	5.35	0.412	0.253	0.037
2 Do	0.939	6.1	190.5	5 hrs					..
3 Do	0.910	10.0	101.3	4 hrs					..
4 Manufactured in India	0.938	3.00	104.0	7 hrs	0.70	3.82	0.202	0.147	0.029
5 Do	0.938	3.05	102.7	8 hrs					..
6 Do	0.935	2.3	105.2	4 hrs					.
7 Do	0.935	2.0	102.0	5 hrs					.
8 Do	0.930	4.3	101.0	3 hrs					.

APPENDIX XLIII

A few representative instances showing the price spreads from producer to consumer in the marketing of Linseed

Note—Figures in brackets denote percentage of consumer's price
(Price per maund of 82 2/7 lb.)

	Producer Cawnpore market consumer (O 1 mil) at Cawnpore	Producer Nagpur Market (O 1 mil) at Nagpur	Producer Patna market Consumer (O 1 mil) at Patna	Producer Gonda market Consumer at Gonda	Producer Udhavar market Consumer at Calcutta	Producer Darhanga market Consumer at Calcutta	Producer Chidanga market Consumer at Calcutta	Producer Oran market Consumer at Cawn pore	Producer Oran market Consumer at Bombay	Producer A rangal ad market Consumer at Bombay
1. Producers Price	Rs A P 3 7 0 (88 5)	Rs A P 3 15 10 (90 2)	Rs A P 3 8 3 (91 9)	Rs A P 3 0 9 (73 7)	Rs A P 3 13 5 (72 7)	Rs A P 3 8 0 (70 1)	Rs A P 1 9 8 (78 5)	Rs A P 3 2 4 (81 0)	Rs A P 3 2 4 (97 7)	Rs A P 3 8 0 (73 9)
2. Handling and cartage from village to assembling market	0 0 10 (1 3)	0 0 7 (0 5)	0 1 0 ⁰⁰ (2 5)	0 1 0 (1 4)	0 1 0 (1 2)	0 1 0 (1 4)	0 1 3 (1 7)	0 1 0 (1 6)	0 1 0 (1 4)	0 0 0 (1 0)
3. Producers Price 1% Market	3 7 10 (89 8)	4 0 3 (91 6)	3 9 9 (93 7)	3 7 9 (75 1)	3 14 5 (73 9)	3 9 8 (77 5)	3 10 11 (80 2)	3 3 4 (82 6)	3 3 4 (99 1)	3 8 9 (74 0)
4. Charges paid at the market by producer	0 2 11 (4 7)	0 3 0 (5 3)	0 1 7 (2 6)	0 4 6 (6 1)	0 1 6 (1 7)	0 0 10 (1 1)	0 4 3 (8 3)	0 1 11 (3 1)	0 1 11 (2 6)	0 1 7 (2 1)
5. Charges paid at the market by buyer	0 0 11 (1 5)	0 0 4 (0 5)	0 0 1 (0 1)		0 0 1 (0 3)			0 0 5 (0 6)	0 0 5 (0 6)	
6. Total charges at assembling market	0 3 10 (5 2)	0 3 4 (4 8)	0 1 8 (2 7)	0 4 6 (6 1)	0 1 9 (2 0)	0 0 10 (1 1)	0 4 8 (8 3)	0 2 4 (3 7)	0 2 4 (3 2)	0 1 7 (2 1)
7. Cost at Assembling Market	3 11 8 (95 0)	4 3 9 (95 8)	3 11 5 (96 4)	3 12 3 (81 2)	4 0 2 (75 9)	3 10 4 (78 6)	3 15 7 (85 5)	3 5 8 (86 3)	3 5 8 (72 3)	3 10 4 (77 0)
8. Wholesaler's margin				0 1 3 (1 7)	0 1 9 (1 8)	0 1 6 (2 0)	0 2 0 (2 7)		0 1 0 (1 4)	0 1 0 (1 3)

APPENDIX XLIV

Specifications for Linseed Oil

	British Standards Institution (BS Specifications)	Indian Stores Department	Defence Department
Description	RAW LINSEED OIL		
Colour	<p>Shall be the product of linseed, free from admixture with other oils or fats. When kept at 16° C to 20° C for 24 hours, the oil shall be free from sediment or other insoluble matter.</p> <p>Shall not be darker than an agreed sample. In the absence of a sample, the colour shall conform to one of the following standards —</p> <p>(a) Not deeper than a colour equivalent to a combination of 70 yellow units and 6 red units on the Iovibond colour scale when measured through a 1" cell.</p> <p>(b) Not darker than a freshly made solution of 0.08 gramme of iodine and 0.8 gramme of pure potassium iodide in 100 millimetres of water viewed transversely in transmitted light in glass tubes 1 centimetre in diameter and about 10 centimetres in length.</p>	<p>To be the genuine product of linseed, free from turbidity, sediment and undissolved water.</p>	<p>Bright and free from sediment and visible impurities.</p> <p>Not darker than a freshly made solution of 0.1 gramme of iodine and 1 gramme of pure potassium iodide in 100 c.c. of water viewed in glass tubes 1 centimetre in diameter and about 10 centimetres in length.</p>

Specific gravity	931 to 936 at 15 °C/15 °C	922 to 926 at 30°C/30°C	931 to 935 at 15 °C/15 °C
Refractive index	1.4800 to 1.4835 for the D line at 20°C		1.4805 to 1.4824 for the D line at 20°C.
Iodine value	Not lower than 175	Not lower than 180	Not lower than 180
Saponification value	Not lower than 188	188 to 193	188 to 192
Acidity	Free from mineral and added organic acids Acid ty shall not exceed the equivalent of 4 milligrammes of potassium hydroxide per kilo per gramme of oil or 2 per cent of free fatty acids calculated as oleic acid	Acid value—Not more than 4.0	Free from mineral acid. Acid value must not exceed the equivalent of 4 milligrammes of potassium hydroxide per gramme of oil
Drying time	Shall become surface dry in not more than 4 days at 60°F to 70°F		Must become surface dry in not more than 4 days at room temperature of not below 15°C
Char upon fire to matter	Not more than 1.5%		Not more than 1.5%
	BOILED INSISTED OIL FOR PAINTS	BOILED INSISTED OIL (Do not boil)	
Description	Shall be clear and free from sediment or oil or insoluble matter when kept at 15°C to 20°C for 24 hours	To be prepared from pure linseed oil and necessary driers, only	Should be prepared from genuine linseed oil and the necessary driers only and must be free from 'foots', turbidity and other visible impurities
Colour		Not deeper than Lovibond (1.5 in 1/16" cell)	Not darker than the tender sample, when viewed transversely in transmitted light in similar glass tubes 1 cm diameter and about 10 cm long
Specific gravity	0.955 at 15 °C and within 24 hr or mass agreed sample, if any	0.929 to 0.941 at 30°C	0.935 to 955 at 15 °C

Specifications for Lensed Oil—contd.

	British Standards Institution (B S Specification)	Indian Stores Department	Defence Department.
Acidity	Free from mineral and organic acids. Acidity shall not exceed the equivalent of 8 milligrammes of potassium hydroxide per gramme of oil or 4.0% of free fatty acids calculated as oleic acid	Acid value—not more than 6.0	Free from mineral acid, free acidity content must not exceed the equivalent of 8 milligrammes of potassium hydroxide per gramme of oil
Drying time	Shall become surface dry in not more than 24 hours at 50° F to 70° F	A glass plate coated with oil and suspended in a vertical position in shade and in a free circulation of air should dry in 8 hours with a firm elastic film free from stickiness	Shall become surface dry in not more than 18 hours at a room temperature of not below 15° C
Ash	Not more than 0.5%		(i) Not more than 0.8% when lead compounds are used as driers. The ash to contain 75 per cent lead (ii) Not more than 0.25 per cent when compounds other than those of lead are used. Not more than 2.5 per cent.
Unaponifiable matter	Not exceeding 2.5%		
Resin	When rosinat driers have been used, rosin present in the oil shall not exceed 1%	..	If rosinat driers have been used, rosin present in oil shall not exceed 1 per cent

APPENDIX XLV.

Monthly wholesale prices of *Unseeded, Unseeded Oil and Unseeded Cake at Bombay*
(Per maund of 52 3/4 lb.)

Month	1933			1934			1935			1936			1937				
	Unseeded oil	Unseeded cake	Rs. A. P.	Unseeded oil	Unseeded cake	Rs. A. P.	Unseeded oil	Unseeded cake	Rs. A. P.	Unseeded oil	Unseeded cake	Rs. A. P.	Unseeded oil	Unseeded cake	Rs. A. P.		
January	4 0 5	0 8 0	2 5 0	4 2 10	0 2 10	2 3 3	5 0	0 11	0 3	2 13	0 5 8	4 13	0 7	1 15	2 5 0	5 12 4	10 3 0 2
February	4 5 0	0 8 0	2 6 0	4 3 8	0 2 10	2 9 1	4 15	4 12	7 9	2 3 10	5 2	4 11	12 0	1 13	5 8	5 3 12	3 4 2 12 1
March	4 2 5	0 8 0	2 5 0	4 7 3	0 14 7	2 10 3	4 10	2 11	6 1	1 15	5 8	5 11	12 0	1 11	8 5	5 10 12	3 4 2 5 8
April	3 11	1 8 1	3 1 14	4 5 8	0 8 9	2 3 4	0	7 11	0 3	2 2 0	5 4	6 11	9 1	1 14	7 6	0 3 12	13 8 2 10 4
May	4 3 6	0 8 7	1 2 2	4 14	7 9 13	8 2 5	7	4 15	0 11	0 3	2 3 10	5 4	6 11	0 1	1 15	0	5 14 1 13 0 7 2 5 3
June	4 10	2 0 11	8 2 6	2 5 4	0 10 10	4 2 9	8	4 12	2 11	0 1	2 3 10	5 3	3 11	12 0	2 0 4	5 15	0 13 2 0 2 7 5
July	4 15	1 8 13	0 2 6	4 15	7 11	0 3	2 10 3	4 12	1 10	3 2	2 2 7	5 6	2 11	12 0	2 7	5 14	1 12 12 2 2 9 9
August	4 14	0 0 8	0 2 6	4 16	7 11	0 3	2 17 9	4 14	4 10	1 8	2 9 10	6 6	1 12	5 3	2 12	1	5 11 0 12 10 8 2 8 7
September	4 10	10 9 8	9 2 7	15 6	0 8 10	10 4	2 13 2	4 11	2 10	4 5	2 0	3 10	0 12	0 5	3 13	10 5	15 6 13 13 8 2 7 5
October	4 8 6	9 14	7 2 5	7 4	9 7	9 8	9 2 12	0 5	0 8 11	13 5	2 1	5 5	2	4 11	13 6	2 10 11	0 1 0 13 2 0 2 9 9
November	4 9 6	9 14	7 2 1	5 4	6 4	9 2 10	3 5	7 5	0 6 11	14 11	1 13	11	5 2	4 11	13 6	2 10 11	5 11 3 13 0 5 2 9 2
December	4 7 3	9 8	0 2 6	9 4	10 10	0 14	7	2 12	0	4 15	2 12	3 9	1 14	1	5 5	7 12	0 5 2 10 11 5 10 0 13 0 7 2 8 7
Annual Average	4 7 6	9 3	9 2	4 11	4 10	8 9	15 4	2 9	0	4 13	8 11	3 10	2 2	3	5 6	2 11	15 1 4 0 5 12 6 1 12 0 2 0 3

Source:—¹ Rates of India " quotations in the first week of every month

APPENDIX XLVI.

Average monthly wholesale prices of Linsed Oil, Linsed Cake and Linsed Cake at Calcutta
(Per cask of 82 2/7 lbs.)

Month	1931			1932			1933			1934			1935			1936			1937		
	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake	Linsed oil	Linsed cake	Linsed cake
January	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0	4 5 0	2 0	2 8 0
February	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0
March	3 11 0	0 0	2 5 0	4 5 11	8 12 0	2 11 0	4 7 8	9 12 0	2 11 0	4 12 2	9 0 0	2 5 0	5 0 5	2 5 11	14 0	2 0 0	5 10	2 12 12	0	3 0 0	0
April	3 10 3	7 12 0	2 3 0	4 7 2	9 0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0	4 0 0	0 0	2 8 0
May	4 1 0	7 12 0	2 8 0	4 15 11	0 8 0	2 10 0	4 12 0	10 12 0	2 4 0	5 2 7	11 8 0	2 3 0	1 5 0	5 2 7	11 8 0	2 3 0	1 5 0	5 13	5 13 2	0	2 14 0
June	4 7 8	8 0	2 8 0	5 2 1	11 0	2 11 0	4 10 3	11 0 0	2 4 0	5 2 2	11 10 0	2 4 0	5 2 2	11 10 0	2 4 0	5 2 2	11 10 0	2 4 0	5 2 2	11 10 0	2 4 0
July	4 13 10	0 0	2 11 0	4 12 9	11 8 0	2 14 0	4 10 3	11 0 0	2 4 0	5 1 3	11 0 0	2 4 0	5 1 3	11 0 0	2 4 0	5 1 3	11 0 0	2 4 0	5 1 3	11 0 0	2 4 0
August	4 0 0	8 0	2 0 0	5 1 1	10 10 0	2 2 0	4 10 11	10 10 0	2 2 0	5 7 8	11 10 0	2 2 0	5 7 8	11 10 0	2 2 0	5 7 8	11 10 0	2 2 0	5 7 8	11 10 0	2 2 0
September	4 8 10	8 10 0	2 0 0	4 11 11	0 6 0	2 15 0	4 11 11	10 12 0	2 2 0	5 0 13	4 11 7 0	2 14 0	5 0 13	4 11 7 0	2 14 0	5 0 13	4 11 7 0	2 14 0	5 0 13	4 11 7 0	2 14 0
October	4 1 5	8 0	2 0 0	4 8 6	8 12 0	2 10 0	4 8 6	8 12 0	2 10 0	5 0 10	11 9 0	2 13 0	5 0 10	11 9 0	2 13 0	5 0 10	11 9 0	2 13 0	5 0 10	11 9 0	2 13 0
November	4 6 6	8 4 0	2 8 0	4 3 11	8 8 0	2 11 0	4 16 0	10 14 0	2 0 0	5 7 4	11 4 0	2 11 0	5 7 4	11 4 0	2 11 0	5 7 4	11 4 0	2 11 0	5 7 4	11 4 0	2 11 0
December	4 6 5	8 4 0	2 12 0	4 10 6	8 8 8	2 12 0	4 14 6	11 6 0	2 1 0	5 9 0	11 8 0	3 0 0	5 9 0	11 8 0	3 0 0	5 9 0	11 8 0	3 0 0	5 9 0	11 8 0	3 0 0
Annual Average	4 4 2	8 7 4	2 8 2	4 10 5	9 6 0	2 11 10	4 12 2	10 2 10	2 3 4	5 5 10	11 7 4	2 8 2	5 5 10	11 7 4	2 8 2	5 5 10	11 7 4	2 8 2	5 5 10	11 7 4	2 8 2

Source.—Linsed prices from Bengal Chamber of Commerce quotations.
Linsed oil and cake prices from merchants' records.

APPENDIX XLVII

Average monthly wholesale prices of Linsed, Linsed Oil and Linsed Cake at Nagpur
(Per maund of 82 27 lb)

Month	1933			1934			1935			1936			1937		
	Linsed oil	Linsed cake		Linsed oil	Linsed cake		Linsed oil	Linsed cake		Linsed oil	Linsed cake		Linsed oil	Linsed cake	
January	Rs 12 0 8 13 4	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8	Rs 14 8 1 14 8
February	Rs 9 7 9 14 8	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2	Rs 10 10 3 11 2
March	Rs 8 0 0 6 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0	Rs 3 3 2 9 0 0
April	Rs 4 0 8 12 0	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4	Rs 4 2 5 8 11 4
May	Rs 9 7 0 2 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8	Rs 14 8 4 9 7 11 8 8
June	Rs 13 2 10 0 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0	Rs 14 8 4 10 5 11 6 0
July	Rs 3 2 10 2 8	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4	Rs 3 11 4 10 9 11 1 4
August	Rs 3 2 10 4 8	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4	Rs 3 5 1 4 12 7 10 7 4
September	Rs 2 10 9 12 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0	Rs 2 2 6 4 11 2 10 4 0
October	Rs 1 7 0 10 8 2	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0	Rs 1 3 4 19 5 10 2 0
November	Rs 0 10 9 6 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0	Rs 2 2 4 8 0 10 2 0
December	Rs 7 11 0 2 8	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0	Rs 2 3 0 4 11 2 10 12 0
Annual Average	Rs 3 13 0 9 0 11 2	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3	Rs 4 6 4 10 2 9 2 2 3

Source—Wholesale merchants records.

Raw	10 4 0	10 4 0	10 12 0	10 12 0	10 12 0	11 8 0	11 8 0	11 8 0	11 8 0	11 8 0	10 4 0	10 4 0	10 14 4
Brand B													
1934													
Boiled													
Brand A (import)	12 10 0	13 12 0	13 4 0	13 0 0	13 12 0	14 2 0	14 2 0	14 2 0	13 12 0	13 12 0	13 8 0	13 10 0	0
Brand D (new in Cal. tin)	10 12	10 12 0	10 12 0	10 12 0	11 12 0	11 12 0	11 12 0	11 12 0	11 12 0	11 12 0	10 12 0	11 4 0	0
Brand C (made in Cal. tin)	10 12 0	10 12 0	10 12 0	10 12 0	11 12 0	11 12 0	11 12 0	11 12 0	11 12 0	11 12 0	10 12 0	11 4 0	0
Brand D (made in Cal. tin)	7 14 0	7 14 0	7 14 0	7 14 0	7 14 0	7 15 0	7 15 0	7 15 0	7 15 0	7 15 0	7 10 0	7 14 3	0
Brand Y (made in Calcutta)	7 10 0	7 10 0	7 10 0	7 10 0	7 12 0	7 10 0	7 10 0	7 14 0			7 14 0	7 11 1	0
Brand F (made in Hong Kong)	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 2	0
Brand G (made in Hong Kong)	8 4 0	8 4 0	8 4 0	8 4 0	8 4 0	8 4 0	8 4 0	8 4 0				8 2 0	0
Brand H (made in Calcutta)	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	0
Boiled													
Brand B	10 4 0	10 4 0	10 4 0	10 4 0	10 4 0	11 4 0	11 4 0	11 4 0	11 4 0	11 4 0	10 4 0	10 12 0	0
1935													
Boiled													
Brand A (import)	13 8 0	13 4 0	13 4 0	13 4 0	12 12 0	13 4 0	13 4 0	13 4 0	14 4 0	14 4 0		13 5 0	0

APPENDIX XVIII—contd
 Prices of various brands of *Insati Oil* at Madras, per 5 gallon *trum*—contd
 (1 of above oil contains 1 liter and 250 gms)

	January	February	March	April	May	June	July	August	September	October	November	December	Average
Brand B (made in Calcutta)	Rs 10 12 0	Rs 10 12 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 12 0 0	Rs 12 0 0	Rs 12 0 0	Rs 11 8 8
Brand C (made in Calcutta)	Rs 10 12 0	Rs 10 12 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 11 4 0	Rs 12 0 0	Rs 12 0 0	Rs 12 0 0	Rs 11 8 8
Brand D (made in Calcutta)	Rs 7 10 0	Rs 7 10 0	Rs 7 10 0	Rs 7 12 0									Rs 7 10 0
Brand E (made in Calcutta)	Rs 7 14 0	Rs 7 14 0	Rs 7 14 0										Rs 7 14 0
Brand F (made in Bombay)	Rs 10 2 0	Rs 10 2 0	Rs 10 2 0	Rs 10 2 0	Rs 10 2 0	Rs 10 8 0	Rs 10 0 0		Rs 10 0 0				Rs 10 3 0
Brand G (made in Bombay)	Rs 8 0 0	Rs 8 0 0	Rs 8 0 0	Rs 8 0 0	Rs 8 0 0	Rs 8 0 0	Rs 7 4 0						Rs 7 0 0
Brand H (made in Calcutta)	Rs 10 4 0	Rs 10 4 0	Rs 10 12 0	Rs 10 12 0	Rs 10 12 0	Rs 10 12 0	Rs 10 12 0	Rs 10 12 0	Rs 10 12 0	Rs 7 8 0	Rs 7 8 0	Rs 7 8 0	Rs 7 13 4
Brand B													

Source—From a newspaper records

APPENDIX XLIX

*Average monthly retail and wholesale prices of Raw Linseed Oil at Delhi**
(Rupees per mason of 82.27 lb.)

Month.	1933		1934		1935		1936		1937	
	Retail.		Retail		Retail		Retail.		Retail	
	Rs. A P	Wholesale	Rs. A P	Wholesale	Rs. A P	Wholesale	Rs. A P	Wholesale	Rs. A P	Wholesale
January	12 5 0	11 8 0	12 5 0	11 0 0	14 9 0	23 0 0	13 5 4	12 6 0	15 3 10	12 8 0
February	12 5 0	11 6 0	12 8 0	11 0 0	14 9 0	13 0 0	13 5 4	12 8 0	15 3 10	12 8 0
March	12 5 0	11 5 0	12 5 0	11 0 0	14 9 0	13 0 0	13 5 4	12 8 0	15 3 10	12 8 0
April	11 10 0	11 1 3	12 8 0	11 0 0	12 8 0	12 0 0	13 5 4	12 8 0	14 8 9	12 14 0
May	11 6 9	10 5 0	12 8 0	11 0 0	12 8 9	12 0 0	13 5 4	12 8 0	14 8 9	13 0 0
June	11 6 9	10 0 0	12 8 0	11 0 0	13 8 3	12 0 0	13 5 4	12 8 0	15 3 10	13 0 0
July	11 6 9	10 0 0	12 8 0	11 0 0	13 8 3	12 4 0	13 5 4	12 8 0	15 3 10	14 0 0
August	11 6 9	10 0 0	12 5 0	11 0 0	13 5 0	11 8 0	13 5 4	12 8 0	15 3 10	13 11 8
September	12 5 0	11 0 0	12 5 0	11 0 0	15 3 9	22 8 0	13 5 4	12 8 0	14 8 9	13 0 0
October	12 5 0	11 2 9	12 8 0	10 6 9	15 3 9	12 8 0	12 8 0	11 10 9	14 8 9	13 0 0
November	12 5 0	11 0 0	12 1 3	10 4 3	15 3 9	22 8 0	12 4 11	11 8 0	14 8 9	13 0 0
December	12 5 0	11 0 0	12 5 0	11 0 0	13 8 3	12 8 0	12 4 11	11 8 0	23 14 7	13 0 0
Annual average	11 15 4	10 13 5	12 4 8	10 14 4	13 18 5	12 8 4	13 1 7	12 4 3	14 13 5	13 0 2

*Supplied by the Superintendent of Industries, Delhi

APPENDIX L.

Average monthly wholesale and retail prices of Raw Linseed Oil at Amraoti

Month.	1933.		1934		1935.	
	Whole sale	Retail	Whole sale.	Retail	Whole-sale	Retail
	Rs A P	Rs A P.	Rs. A. P.	Rs A P	Rs A P	Rs A P.
January	10 1 9	10 15 6	9 13 0	10 9 3	13 0 3	13 10 1
February	10 1 9	10 15 6	9 14 4	10 9 4	13 6 2	14 1 5
March	10 1 1	11 3 9	10 2 10	10 15 2	11 3 0	11 4 0
April	9 13 6	10 12 11	10 0 11	10 11 7	12 3 8	12 14 8
May	9 10 5	10 8 7	10 10 11	11 6 2	12 6 11	13 1 11
June	9 5 4	10 4 6	11 10 6	12 5 6	12 5 6	13 0 6
July	10 1 7	10 0 9	12 5 6	13 0 6	.	.
August	10 7 1	11 6 7	11 11 6	12 6 6	..	.
September	10 3 9	11 1 6	11 10 6	12 5 6	.	..
October	10 8 7	11 5 0	11 10 6	12 5 6	..	.
November	10 6 4	11 3 2	11 6 5	12 1 5	.	.
December	10 1 9	10 15 6	11 9 4	12 4 1	..	.
Annual Average	10 1 3	10 14 5	11 0 10	11 12 1	12 6 11	13 0 1

Source — From records of an oil mill.

APPENDIX LI

Extract from the London Cattle Food Trade Association Contract for Imported Feeding Cakes and Meals

Quality—At time of loading to be fair average of the season's shipment
 To contain not less than per cent of oil and albuminoids combined,
 and not more than per cent of sand and/or silica

Should the whole or any portion not turn out equal to warranty the goods must be taken at an allowance to be agreed or settled by arbitration as provided below except that for any deficiency of oil and albuminoids there shall be allowances to buyers at the following rates viz 1 per cent of the contract price for each of the first 3 units of deficiency, under the guaranteed percentage, 2 per cent of the contract price for the fourth and fifth units and 3 per cent of the contract price for each unit in excess of five and proportionately for any fraction thereof For any excess of sand and/or silica there shall be an allowance of per cent of the contract price for each unit of excess and proportionately for any fraction thereof Should the Cake and/or Meal contain over 5 per cent of sand and/or silica the buyer is entitled to reject the goods, in which case the contract shall be null and void for such quantity rejected

The goods are warranted free from castor seed husk but should the analysis show a percentage of castor seed husk not exceeding 005 per cent the buyer shall not be entitled to reject the goods but shall accept them with the following allowances 2s 6d per ton not exceeding 001 per cent, 3s 9d per ton not exceeding 002 per cent and 5s per ton not exceeding 005 per cent Should the first analysis show the goods free from castor seed and/or castor seed husk such analysis shall be final but in the event of the first analysis showing castor seed husk to be present a second sample may be analysed at the request of either party and the mean of the two analysis shall be taken as final Should the parcel contain castor seed husk in excess of 005 per cent buyers shall be entitled to reject the parcel, in which case the contract shall be null and void for such quantity rejected

Latent defect—The goods are not warranted free from defect rendering same unmerchantable, which would not be apparent on reasonable examination any statute or rule of law to the contrary notwithstanding

Sampling and analysis—Samples of each mark to be drawn on or before removal from the ship or quay and sealed in four portions jointly by Sellers and Buyers or their representatives If required by Buyers one sealed sample shall within ten days of sealing be submitted for test to the analyst of the London Cattle Food Trade Association (inc) to whom samples and instructions should be sent direct If then required by either party not later than ten days after receipt of official copy of analysis a second sealed sample shall be at once submitted for test to Dr Bernard Dyer and Partners Limited The mean of the two analyses shall be accepted but if the variation exceeds a half per cent a third sealed sample shall, at the request of either party made not later than ten days after receipt of official copy of the second analysis, be at once submitted for test to Dr Aug

Voelcker and Sons and the mean of the two analyses nearest to each other shall be accepted as final and binding on both parties. Should the analysis or analyses award an allowance to Buyers, the cost of the test or tests shall be borne by Sellers but in the contrary event, the cost of the test or tests shall be for Buyers account. The fourth sealed sample shall be retained for arbitration purposes if required. Claims in respect of analysis shall be made by the last Buyers within twenty one days after receipt of the final certificate of analysis.

• • • • •

APPENDIX LII

Extract from the Hamburg Cattle Food Trade Association General Annual Contract No III A (Indian Oilcakes)

1 Weight—2,210 English lb = 1016 kilos (a) Shipping weight guaranteed within 1 per cent

Sellers shall reimburse buyers promptly after receipt of weight certificate for any loss in weight exceeding 1 per cent of the weight invoiced. On the other hand Buyers to pay sellers for any weight in excess of 1 per cent of the weight invoiced respectively the Bill of Lading weight.

(a) Delivered weight

Any deficiency or excess in weight is to be settled promptly after receipt of weight certificate, except in cases arising from Sea Accidents or from causes considered equal thereto, when the invoiced or the Bill of Lading weight is to be final.

10 When sales are made on type sample slight variations in colour and grinding are not to be objected to. Where no uniformity of colour and grinding is provided for, goods of fair average contract quality are to be accepted as good delivery. In the case of oilcakes, reasonable breakage is not to be objected to.

In the event of castor seed being found, even if only in traces buyers are entitled to either reject the goods or to accept them with allowance.

Should buyers avail themselves of the right of rejection they are entitled to a refund or quay charges, reception charges, lighterage and loss of interest. The presence of castor seed is proved if shown by any one analysis even though another test may show a different result. Sellers, however, are entitled to claim from buyers that the remains of the sample on the strength of which the presence of castor seed has been found are to be re-sealed by the Analytical Chemist and that this sample is to be held at the disposal of sellers for a second analysis with regard to the quantity of castor seed contained. The mean of the results thus obtained is to form the basis for final adjustment. On the analyses of the Hamburgische Botanische Staats-Institute and/or the laboratories of Prof Dr Schmidt and Wewers and/or Dr Carl Enoch of Hamburg are to be recognised for the testing of castor seed.

Should buyers agree to take delivery of the goods even if containing castor seed, sellers have to grant to buyers the following allowance according to the quantity of castor seed present —

2 per cent of the contract price if the presence of Castor seed does not exceed	0.002 per cent
2½ per cent of the contract price if the presence of Castor seed does not exceed	0.005 per cent
3½ per cent of the contract price if the presence of Castor seed does not exceed	0.008 per cent
4½ per cent of the contract price if the presence of Castor seed does not exceed	0.02 per cent
5½ per cent of the contract price if the presence of Castor seed does not exceed	0.05 per cent
7½ per cent of the contract price if the presence of Castor seed does not exceed	0.08 per cent

9 per cent of the contract price if the presence of Castor seed does not exceed	0 10 per cent
11 per cent of the contract price if the presence of Castor seed does not exceed	0 25 per cent.
15 per cent of the contract price if the presence of Castor seed does not exceed	0 5 per cent

In the event of deficiency of Oil and Albuminoids sellers have to allow buyers 1 per cent for each per cent of deficiency upto 3 per cent, 2 per cent for each further per cent of deficiency if the deficiency amounts from 3 per cent to 5 per cent., 3 per cent for each further per cent of deficiency if the deficiency exceeds 5 per cent

The presence of sand upto $2\frac{1}{2}$ per cent is not to be objected to Goods containing from $2\frac{1}{2}$ per cent to 5 per cent are to be accepted by buyers against an allowance The allowance to be 1 per cent of the purchase price for each per cent in excess of $2\frac{1}{2}$ per cent If the presence of Sand is in excess of 5 per cent buyers are entitled to reject the goods and to demand refund of the expenses, incurred for quay charges, reception charges, lighterage and loss of interest

Should buyers decide to return the goods on account of too high a percentage of sand or on account of the presence of castor seed even if found only in traces if upto 0.02 per cent the market value of sound goods on the day when the goods were rejected is to be fixed by a broker appointed by the Chairman of Section 1 of the Cattle Foods Trade Association of Hamburg, or by a member of the Committee acting on his behalf, and on the basis of the price thus fixed settlement pro and contra is to be made between sellers and buyers Fees for the determination of price to be borne by sellers

Notice of rejection to be given immediately upon receipt of analytical results, either direct to sellers or other agents

Only analyses made by Hamburg Sworn Analytical Chemists and the Botanical State Institute of Hamburg will be recognised, with the exception of analyses for castor seed

Sealed samples are to be submitted to the analyst within 5 working days from the date of sampling Should the result of the analysis show an under test, sellers have the right to have the second sample analysed by another sworn Hamburg Chemist not later than 8 working days after they or their agents have received the results of the first analysis In the event of the two analyses the two to form the basis of allowance Should the difference between the two analyses exceed $\frac{1}{2}$ per cent the third sample at the request of either party shall be submitted for analysis (failing agreement, to some other chemist) to the Botanical State Institute of Hamburg and the mean of the two analyses nearest to each other shall form the basis for allowance Should the result of the analyses be such as to award an allowance to Buyers, the cost of the analyses shall be borne by Sellers but in the contrary event by Buyers Claims for under test shall not be valid unless made within 8 days from the date of certificate of analysis

Should the analysis show an under test of Oil and Albuminoids of 10 per cent or more, buyers have the right either to receive the goods at the allowance provided for or to reject them, in which latter event all expenses shall be for sellers' account

12 Should the goods be inferior in quality or in contents to contract warranty buyers shall not be entitled to reject but shall take delivery and pay for them in accordance with the contract The amount of the damages for inferior quality and/or of the allowances for inferior contents shall then be determined by Arbitration

APPENDIX LIII

Typical Contract used by Exporters in India for the purchase of Oilcakes

A/c _____ Broker _____ No _____

of 193 _____ Calcutta, _____ 193 _____

It is mutually agreed between _____, Calcutta, hereinafter called 'Buyers' and _____ hereinafter called "Sellers" that Sellers sell and Buyers buy the following goods —

Quantity _____ Tons (_____ Tons) 1 per cent more or less

Quality _____

Price — Rs _____ (namely Rupees _____, annas _____ and pies _____) per maund of 82 2/7 lb nett including bags

Due date — The goods to be delivered by 3 P.M. of _____ (date, month and year)

Tenders — Buyers to have the option of asking the Sellers to tender the goods either —

(1) At the Buyers Sheds rented from Port Commissioners at Kantapukur, or

(2) Alongside a named steamer

Goods shall be deemed to have been accepted only when the Delivery Receipt has been given by Buyers to Sellers

Packing — In strong second hand bags with no patches or holes. Each bag to contain _____ Mds _____ Srs _____ Chks (Mds of 82 2 lb) or _____ lb nett/gross

Basis — The goods to be free of any percentage of Castor seed and guaranteed to contain —

Not less than _____ per cent Oil and Albuminoids

Not less than _____ per cent Nitrogen

Not more than _____ per cent Sand

Analysis — To be made by Messrs _____ or by _____ Analysis fees to be paid by Buyers if the quality is equal to or over the guarantee and by Sellers if under

Allowances — Oil and Albuminoids — Deficiency of the guaranteed percentage of Oil and Albuminoids to be calculated as follows —

For the 1st 3 units or part thereof 1 per cent per unit

For the 4th and 5th units or part thereof 2 per cent per unit.

For the 6th and subsequent part thereof 3 per cent per unit.

Nitrogen — Deficiency of the guaranteed percentage of Nitrogen to be calculated as follows —

Deficiency multiplied by the price and the product divided by the guaranteed percentage of Nitrogen

Sand—Excess of sand over the guaranteed percentage to be calculated as follows —

1 per cent per unit and proportionately for any fraction thereof
Over 5 per cent, Buyers option to reject

Castor seed—The scale of allowance for Castor seed is as follows —

Upto 004 per cent	Free
Above 004 per cent upto 006 per cent	1 anna per maund
Above 006 per cent upto 008 per cent	2 annas per maund
Above 008 per cent to be rejected	

Weighment and Sampling—To be made by Buyers in Sellers' presence and at Buyers' expense. Should Sellers fail to attend at the time and place of weighment and sampling as given to them by Buyers (notice of which shall be sent to Sellers not less than 48 hours previous to the appointed time) Buyers to draw samples and effect weighment and such weighment and sampling to be final

Payment—In cash against delivery of the goods

Buyers may appropriate from the moneys payable by them to Sellers the amount of any outstanding Bill they have against Sellers

Default—In the event of the Sellers failing to deliver the whole or any portion of the goods contracted for Buyers to have the following options —

- (1) of cancelling the undelivered portion of the contract,
- (2) of holding the Sellers responsible for the difference between the contract price and the price ruling for ready goods at the place of delivery on the day following due date

Insolvency—In the event of Sellers or any of them being adjudicated insolvent or filing a petition for such adjudication or entering into a composition or arrangement with their or his creditors or committing an act of insolvency Buyers shall immediately on the day of such event have the same rights as to determination of the Contract or otherwise as if Sellers had defaulted and that were the last day for delivery

Arbitration—All disputes whatsoever arising on or out of this Contract shall be referred to arbitration under the rules of the Tribunal of Arbitration Bengal Chamber of Commerce applicable for the time being for decision and such decision shall be accepted as final and binding on both parties to the Contract. The award may at the instance of either party or without notice to the other of them be made a rule of the High Court of Judicature at Fort William in Bengal

Signatures—Anything besides plain signature in any language other than English shall be void

Sellers

GLOSSARY OF VERNACULAR TERMS

A

<i>Adhel</i>	}	Measures for grain and oilseeds
<i>Adhol</i>		
<i>Angi</i>		Handful
<i>Arhat, Arat</i>		Commission and the business carried on by commission agents
<i>Arhatiya or Arhatdar, Aratdar</i>		Commission agent

B

<i>Bahangi</i>	A pole the ends of which are connected by ropes to a flat contrivance for carrying load the pole being balanced on the shoulder (Also <i>Banka kawad</i>)
<i>Baidha</i>	Shallow dug out half above and half below the ground used for storing grain etc
<i>Banjan</i>	Quarantee broker who frequently combines the business of a <i>shroff</i> or banker
<i>Banija</i>	Village merchant who primarily trades in agricultural produce but who is generally the village financier
<i>Banla</i>	See <i>bahangi</i>
<i>Bardana</i>	Sack—usually refers to the jute sacks or gunny bags used in the produce trade (see also <i>bora</i>)
<i>Basta</i>	See <i>bardana</i>
<i>Bayā</i>	Weighman or measurer
<i>Bayāi</i>	Market tax
<i>Bazar Dhara</i>	Bazar terms
<i>Beopari</i>	A trader an itinerant merchant
<i>Bhandari</i>	Storekeeper
<i>Bharoi</i>	Vase shaped receptacle made of mud used for storing grains etc
<i>Bhishti</i>	Waterman or water carrier
<i>Bhusa</i>	Straw husk
<i>Boma(h)</i>	An open end spear used for drawing samples from bagged grain or seed (See also <i>parlhi</i>)
<i>Bora(h)</i>	See <i>bardana basta</i>
<i>B-riffy</i>	A retaining fee or allowance

C

<i>Chabens</i>	..	.	Food or diet allowance
<i>Chaudhari</i>		.	Headman
<i>Chekku</i>	.	.	See <i>ghani</i>
<i>Charhia or Charrahia</i>	..	.	Labourer who holds the bag near the scale or puts the bag on the pan at the time of weighment
<i>Chhatank</i>	.	.	1/16th part of a seer, equivalent to 5 tolas.
<i>Cholam</i>		.	<i>Sorghum Vulgare</i> One of the millets grown in South India
<i>Chowki</i>	..	..	A Central Provinces grain measure.
<i>Chowkidar</i>	.	.	Watchman

D

<i>Datal</i>	..	..	Broker
<i>Dalah</i>	.	..	Brokerage
<i>Dandidar</i>	..	.	Scaleman
<i>Darshani hundi</i>	.	.	A sight draft
<i>Deorhi</i>	..	..	One and a half times, system of loans in which one and a half times the quantities (of seed) borrowed are refunded
<i>Derhser (seer)</i>	.	..	One and a half seer
<i>Desi</i>	.	..	Local, indigenous
<i>Dhalta</i>	.	.	Draftage or weighment allowance in favour of buyer
<i>Dhara</i>		.	Laterally—flow, practice
<i>Dharmada</i>	.	.	A deduction for charity
<i>Dhola</i>		.	Receptacles made out of bamboo splits, used for storage of grains and oilseeds
<i>Dholi</i>	.	.	Diminutive of <i>dhola</i>
<i>Dwala</i>		.	A Hindu festival, when illuminations take place on a large scale
<i>Dokda</i>	.	..	Half anna (Term used in Bombay grain trade)
<i>Dooli</i>	.	.	Small receptacle made of bamboo strips
<i>Durga Puja</i>		..	Worship of the Goddess Durga—an important Hindu festival in the late autumn

G

Gaddi

Laterally a mattress the term is applied to denote a place of business, from the fact that it is customary for the clerks employed by *arhatiyas*, *shroffs*, etc., to work seated on mattresses.

Gaddi Kharch

A deduction made by the *arhatiya* to defray office expenses

<i>Ganda</i>	Laterally—set of four the term is used to mean an anna in east United Provinces and adjoining parts of Bihar
<i>Ganj or Gunj</i>	A grain market
<i>Ga-ar</i>	A mixture of wheat or gram and linseed
<i>Ghani</i>	A primitive arrangement for the extraction of oil, largely used in villages
<i>Gonia</i>	A Bihar and Orissa measure
<i>Goschals or Goschals</i>	A institution providing shelter for old decrepit and invalid cow
<i>Gur</i>	Unrefined sugar

H

<i>Hammal</i>	A porter or market labourer
<i>Hammali</i>	Wages charged by <i>hammal</i>
<i>Hat</i>	A periodical market
<i>Howra</i>	Name given to white or yellow linseed in the Central Provinces
<i>Humka</i>	A method of sale in which the buyer makes his bid after a visual examination of the produce
<i>Hundi</i>	A bill of exchange or draft
<i>Hundi-kar</i>	A forwarding or clearing agent

J

<i>Jalsani</i>	Laterally—light refreshments from <i>jal</i> (water) and <i>pani</i> (to drink)
----------------	---

K

<i>Kachcha</i>	Laterally raw and unfinished The word has a wide range of meaning e.g. a <i>kachcha</i> road is an unmetalled road <i>kachcha</i> as applied to work would imply slipshod or inefficient <i>kachcha arhatiya</i> a trader of small means dealing in agricultural produce before it is bagged or made ready for final sale
<i>Kajari</i>	A menial (female) who cleans cooking utensils
<i>Kali mai</i>	A Hindu goddess Laterally Mother Kali
<i>Karda</i>	Impurities or foreign matter also allowance for the same
<i>Kast</i>	Sales made after deducting the impurity content which is determined on the basis of a sample of 5 seers
<i>Katr</i>	A Bihar and Orissa gram measure
<i>Katha</i>	A Central Provinces gram measure

<i>Kawad</i>	See <i>bahang</i>
<i>Khandy</i> (Candy)	A measure used in the Central Provinces and in some of the adjacent areas
<i>Kharch-gari</i>	Charges for cart
<i>Khattis</i>	Underground pits or dug outs used for storing grain etc
<i>Khirwar</i>	A weight used in the rural areas in Kashmir (equivalent to 83 standard seers)
<i>Ko. has</i>	See <i>beopari</i>
<i>Kothus</i>	See <i>ghana</i>
<i>Kothalas</i>	Large vase shaped receptacles made of mud used for storing grains and oilseeds
<i>Kotla</i>	A room in which produce is stored also a living room
<i>Kothi</i>	See <i>kothalas</i> also a business house
<i>Kunkar</i>	Small pieces of stone gravel
<i>Kuras</i>	A United Provinces measure
<i>Kuro</i>	A Central Provinces measure

L

<i>Lotnas</i>	A kind of receptacle made of wicker work of rice straw with a capacity of 2 to 5 maunds of linseed
---------------	--

M


<i>Mahajan</i>	Money lender or banker literally, a great man
<i>Malquzar</i>	One who pays land tax, a landlord
<i>Manda Mandi</i>	literally—cheapness Bear option
<i>Ma di</i>	A market
<i>Mans</i>	A Central Provinces measure
<i>Maq.</i>	A measure.
<i>Marwari</i>	One hailing from Marwar in Rajputana. As a community well known for their business capacity and astuteness
<i>Mela</i>	A fair
<i>Mocha</i>	A small container made out of rice straw used for storage for grains and oilseeds
<i>Moongries</i>	Wooden mallets
<i>Muccaddam</i>	literally essential hence headman or chief Labour contractors and middlemen who figure largely in the Bombay grain and oilseeds trade are also called by this name

<i>Muddat</i>	—	..	Laterally—"period" A deduction made by the <i>arhatiya</i> to cover the loss of interest on money which he pays in advance to his seller client
<i>Muddats-hundi</i>	—	—	A bill of exchange drawn for a specified period
<i>Munim</i>	—	..	A deduction made for clerks

N

<i>Nakadar</i>	—	..	Scaleman
<i>Note batta</i>	—	..	Deduction made for making payment in silver and not currency notes

P

<i>Pakka</i>	.	..	.. Laterally—true or mature or real A <i>pakka arhatiya</i> is a true wholesaler
<i>Pai</i>	..	..	.. A local weight in Kashmir varying from 20 to 30 seers
<i>Paola</i>	..	..	.. A United Provinces grain measure
<i>Pahi</i>	..	—	.. A Central Provinces grain measure
<i>Pawth</i>	—	—	See <i>hat</i>
<i>Pasroo</i>	..	..	.. A type of storage receptacle made of bamboo strips and plastered with mud and cow dung
<i>Palledari</i>	—	..	.. Labour or handling charge
<i>Palledar</i>	—	—	.. Market labourer.
<i>Panchayat</i>	—	..	.. A body selected to act as umpires, from " <i>panch</i> " meaning five
<i>Pao</i>	..	..	.. One quarter, a quarter seer.
<i>Parkhi</i>	..	—	.. A sampler, an instrument for drawing samples from bags
<i>Path</i>	—	..	.. Sale receipt
<i>Phalla</i>	..	..	.. Beam used in threshing grain and oilseeds
<i>Phanks</i>	—	..	.. A deduction for loss in handling
<i>Phut katoti</i>	..	..	.. A deduction for giving small change
<i>Pni</i>	..	..	.. A kind of sweetmeat made from linseed and gur
<i>Pnjrapole</i>	..	..	.. Institution providing shelter for cattle.
<i>Pardah or parda</i>	—	..	.. A cover
 <i>P</i>	..	..	.. A Bombay measure of 4 seers

R

<i>Rabi</i>	..	..	.. Spring crop
<i>Rulai</i>	—	..	.. Rolling